This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

118
86.450

FIRST BOO

IN

ARITHMETI

Educt 118.86.450

ENGLISH CLASSICS.

EDITED, WITH NOTES,

The
The
Juliu
Ham
As Y
Henr
Mach
Henr
A Mi
Rich
Rich
Much
Anto
Rom
Othel
Twel
The
King
Hen
Hen

ll.

le

HARVARD COLLEGE
LIBRARY

GIFT OF THE
GRADUATE SCHOOL
OF EDUCATION

Copic ol.

In im
to ada ext
(expu nd
illustra

Each of Shakespeare's plays is complete in one volume, and is preceded by an introduction containing the "History of the Play," the "Sources of the Plot," and "Critical Comments on the Play."

Published by HARPER & BROTHERS, New York.

☞ Harper & Brothers *will send any of the above works by m*
paid, to any part of the United States, on receipt

INTERESTING BOOKS FOR BOYS AND GIRLS.

THE BOY TRAVELLERS IN THE FAR EAST. By Thomas W. Knox. Profusely Illustrated. Five Parts. 8vo, Cloth, $3 00 each.

Part I. Adventures of Two Youths in Japan and China.

Part II. Adventures of Two Youths in Siam and Java. With Descriptions of Cochin-China, Cambodia, Sumatra, and the Malay Archipelago.

Part III. Adventures of Two Youths in Ceylon and India. With Descriptions of Borneo, the Philippine Islands, and Burmah.

Part IV. Adventures of Two Youths in Egypt and the Holy Land.

Part V. Adventures of Two Youths in a Journey Through Central Africa.

THE STORY OF LIBERTY. By Charles Carleton Coffin. Illustrated. 8vo, Cloth, $3 00.

OLD TIMES IN THE COLONIES. By Charles Carleton Coffin. Illustrated. 8vo, Cloth, $3 00.

THE BOYS OF '76. A History of the Battles of the Revolution. By Charles Carleton Coffin. Illustrated. 8vo, Cloth, $3 00.

BUILDING THE NATION. From 1783 to 1861. By Charles Carleton Coffin. Illustrated. 8vo, Cloth, $3 00.

HARPER'S YOUNG PEOPLE SERIES. Illustrated. 16mo, Cloth, $1 00 per volume.

TOBY TYLER. By James Otis.
MR. STUBBS'S BROTHER. A Sequel to "Toby Tyler." By James Otis.
TIM AND TIP. By James Otis.
RAISING THE "PEARL." By James Otis.
THE MORAL PIRATES. By W. L. Alden.
THE CRUISE OF THE "GHOST." By W. L. Alden.
THE CRUISE OF THE CANOE CLUB. By W. L. Alden.
THE TALKING LEAVES. An Indian Story. By W. O. Stoddard.
MILDRED'S BARGAIN, and Other Stories. By Lucy C. Lillie.
NAN. By Lucy C. Lillie.
THE FOUR MACNICOLS. By William Black.
WHO WAS PAUL GRAYSON? By John Habberton.
THE ICE QUEEN. By Ernest Ingersoll.
PRINCE LAZYBONES. By Mrs. Hays.
LEFT BEHIND; or, Ten Days a Newsboy. By James Otis.

NEW GAMES FOR PARLOR AND LAWN. By G. B. Bartlett. 16mo, Cloth, $1 00.

Published by HARPER & BROTHERS, New York.

☞ Harper & Brothers *will send any of the above works by mail, postage prepaid, to any part of the United States or Canada, on receipt of the price.*

3 2044 097 000 988

HARPERS' GRADED ARITHMETICS

FIRST BOOK IN ARITHMETIC

COMPRISING

TWO YEARS OF ORAL AND WRITTEN WORK
IN THE ELEMENTS OF NUMBERS

NEW YORK
HARPER & BROTHERS, FRANKLIN SQUARE
1886

Educ T 118, 86, 450

HARVARD COLLEGE LIBRARY
GIFT OF THE
GRADUATE SCHOOL OF EDUCATION
28 May '29

Copyright, 1882, by HARPER & BROTHERS.

All rights reserved.

PREFACE.

WHATEVER instruction in numbers is given to children in the beginning of their school course should be oral, and purely objective. Oral instruction usually continues through about two school years, or until the children can read readily and intelligently in a Second Reader.

This book is intended for the third and fourth years in a school course; and is the first of a series of two books embracing a complete course in arithmetic, both oral and written, for schools below the high-school grade.

Oral and written work are combined throughout the book. Pages 9–59 contain work for one year; and pages 61–140 contain work for a second year. The lessons in the first ten numbers embrace all the possible combinations that form these numbers; numerous practical applications; and the use of the necessary signs and terms. The lessons on these ten numbers are arranged as follows:

I. INDUCTION.—In these introductory lessons the child is made familiar with each number as made up of ones, with its relation to the preceding number, and to the number *one*.

II. MEASURING.—In these lessons every possible combination that forms the number, all of the relations of the number to each number smaller, and the equal fractional parts of the number are brought out by questions on the objective plan.

III. TABLE.—Having formed all the combinations that produce the number, an outline for the table of these combinations is given, which is to be filled up, learned, and recited by the pupil.

IV. COMPARISON.—In these lessons the pure or abstract number is compared, in all possible ways, with all less numbers.

V. **Combinations.**—In these exercises all the pure numbers that have formed the subjects of previous lessons are variously combined, the result of no combination exceeding the number which forms the subject of the lesson.

VI. **Applications.**—These consist of exercises or problems in applied or concrete numbers, no result being greater than the number which forms the subject of the lesson.

Written Work.—This includes the outlines for the tables of combinations, and numerous exercises and problems for slate and blackboard work.

In brief, the lessons, in their order, on each of the ten numbers are—I. Induction; II. Measuring; III. Constructing Table; IV. Comparison; V. Combinations; VI. Applications.

The lessons on the numbers 10–100, pages 61–77; and on the numbers 100–1,000, pages 79–99, are arranged on the same general plan as those in the first ten numbers, the advancement being more rapid, to keep pace with the constantly increasing abilities of the child. Pages 100–140 make the child familiar with the written processes of notation, addition, multiplication, subtraction, and division of numbers less than one billion—including United States money,—and give him a large amount of practice in both oral and written work.

Models of Work.—Models are given of slate and blackboard work, and of oral explanations and solutions, suited to the age and advancement of the pupils.

Instruction in the elements of numbers, in accordance with the plan developed in this book, will give to children—

1. Ability to write, read, and use numbers less than one billion;
2. Knowledge of all the tables of elementary combinations;
3. Facility in giving oral and written solutions of questions in integers and United States Money; and
4. Familiarity with the fundamental operations of written arithmetic, and a thorough preparation for the study of the Second Book in Arithmetic.

SUGGESTIONS TO TEACHERS

On pages 5, 6, 7, 60, 78, 100, and 121 are suggestions on points which require special attention, and which can be referred to in this way better than in the text of the book. It is not intended to prescribe forms and methods, but to offer a few hints to aid in the successful use of this book.

Assigning Work.—The activity of child nature demands that the child have employment. Therefore, with every lesson assigned, give the pupil work to do at his seat, and give him all necessary instruction how to do that work. *Tell him what to do*, and, if necessary, *show him how to do it.*

Written Work.—Give particular attention to all the written work of the pupil. See that his slate is properly ruled before he begins written work, and inspect the work after he has finished it.

Class Work.—Devote a portion of the time of each recitation to an animated drill upon impromptu exercises similar to those contained in the lesson for the day. Test the comprehension of the pupil by familiar questions similar to those contained in the text of the lesson. Illustrate on the board, by lines and diagrams, questions that admit of such illustration, and then require the pupil to do the same.

Use of Books in Class.—Pupils encounter more difficulty in arithmetic from inability to read correctly than from any other cause. To become good arithmeticians, they must read *understandingly.* No amount of reading *for* them, or *to* them, or explanation by the teacher, can make good the inability to read *intelligently.* Therefore, require each pupil to read from the book, in the class, the exercises of the lesson, and then to state orally the meaning of what he has read.

Forms of Answer.—Require only brief answers to the questions in applied, or concrete, numbers. Always require pupils to answer in complete sentences and in correct language. Whenever you can give a better form of answer than is found in the book, adopt it; but before doing this, be sure that it *is* better, both for the particular question or kind of questions, and for the pupil or class.

Oral Instruction.—Impromptu oral exercises should be either—

1st. To prepare the pupil for a lesson to be learned from the book; or,

2d. For drill in connection with a lesson or recitation; or,

3d. To test the pupil's knowledge of subjects already passed over—*i. e.*, for *review or examination.*

Use no time in giving oral instruction on topics in numbers not immediately connected with the lessons in the regular course.

Tables of Combinations.—A knowledge of the elementary combinations is indispensable to any progress in arithmetic. Therefore, give pupils frequent and thorough drills in the tables of combinations.

Keeping pupils employed a few minutes once or twice each day, in writing tables of combinations, aids in fixing these tables in their memories.

After a table of combinations has been learned, allow no counting to form the same combinations. If a pupil is to add 3 to 6, multiply 6 by 3, subtract 3 from 6, or divide 6 by 3, require him to form the combination from knowledge of the tables already acquired.

LESSONS IN THE NUMBERS 1 TO 10, INCLUSIVE.

Page 9.—In the picture on page 8 are shown all the objects mentioned in the questions on page 9. Vary the questions on this page, by using the names of other objects. Thus:

Two boys and one boy are how many boys?
One girl and one girl are how many girls?

Teach children to make neat figures. This may be done by requiring them, one day, to write on their slates five columns of ten 1's each, and five columns of ten 2's each. Another day require them to write 3's and 4's in the same manner; and so on. This will give them written work at their seats for a week or more. Practice of this kind for two or three weeks will secure the object sought. At first, rule column lines on their slates, or have the pupils rule them, as guides in writing figures in columns.

Page 10.—In reciting the lessons found on this page, pupils should have their books open, and the objects named in any question should be counted, in the cut, before the answer to the question is given.

Page 12.—The marks made by the pupil become visible objects, which he uses in measuring the first ten numbers. Require him to use other objects in a similar manner.

Page 13.—Require the pupil, in measuring numbers, to use marks and other visible objects, before using the applied, or concrete, numbers given in these exercises.

Page 16 (b), Questions 5 and 6.—In all cases where remainders occur, teach pupils to call them so many *over*, or so many *remainder*. Neither require nor permit pupils to give a remainder in a fractional form—as halves, thirds, etc.

Table of 3.—Allow the pupil to use counters in completing this table, and in forming and completing similar tables.

IV.—The form of expression, "Three ones are three," "Four twos are eight," etc., is limited to pure, or abstract numbers; while the form, "Three times one is three," "Four times two birds are eight birds," etc., is the necessary form for applied, or concrete, numbers. Require pupils to use the proper form with each class of numbers.

Page 31.—It may be well to explain the terms *Vertical*, *Oblique*, *Horizontal*, and *Parallel*, and to require pupils to use the proper terms in describing each sign.

Page 33.—Lessons **a, b, c, d,** are for drill in combinations of the numbers 1, 2, 3, 4, 5, 6. Use any one of the following methods, with these and all similar exercises:

1. As an exercise is read, require answer—from pupil or class—to each new combination in the exercise, when it is named in the reading.

2. As each combination in an exercise is read, require all who can give the result to raise the hand, but have only the final result given orally, after the reading of the exercise is finished.

3. As the successive combinations in an exercise are read, require each member of the class, in turn, to name the result.

4. Call for final result—from pupil or class—when the reading of the exercise is finished.

Pages 33; 37, *V*; 42, *V*; 48, *V*; 53, *V*; 56, *C*; 58, *G*; etc.

In reading numbers connected by signs of operation (*i. e.* by +, ×, −, ÷) observe:

1. When the sign × or the sign ÷ stands between numbers and is not preceded by a comma, perform the multiplication or division before making any combination indicated by a sign preceding the first of these numbers.

Thus, $3+5-2\times 3=2$; $6+8\div 2-3=7$.

2. When the sign × or the sign ÷ stands between numbers and is preceded by a comma, multiply or divide the result of all the combinations preceding the sign by the number following the sign.

Thus, $3+5-2, \times 3=18$; $6+8, \div 2-3=4$.

I. Counting.

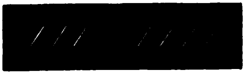
1. One mark.
2. Two marks.

One horse. 1
Two cows. 2

One cow and one cow are how many cows?

One cow and one cow are two cows.

3. Three marks.
4. Four marks.



Three doves. 3
Four men. 4

Two doors and one door are how many doors?
Three men and one man are how many men?

5. Five marks.
6. Six marks.

Five trees. 5
Six sheep. 6

Four trees and one tree are how many trees?
Five sheep and one sheep are how many sheep?

7. Seven marks.
8. Eight marks.

Seven goats. 7
Eight hens. 8

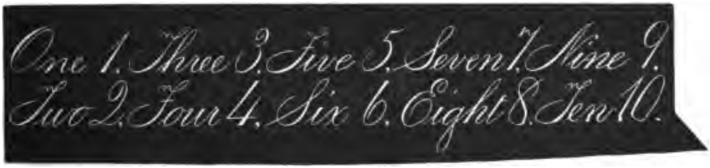
Six goats and one goat are how many goats?
Seven hens and one hen are how many hens?

9. Nine marks.
10. Ten marks.

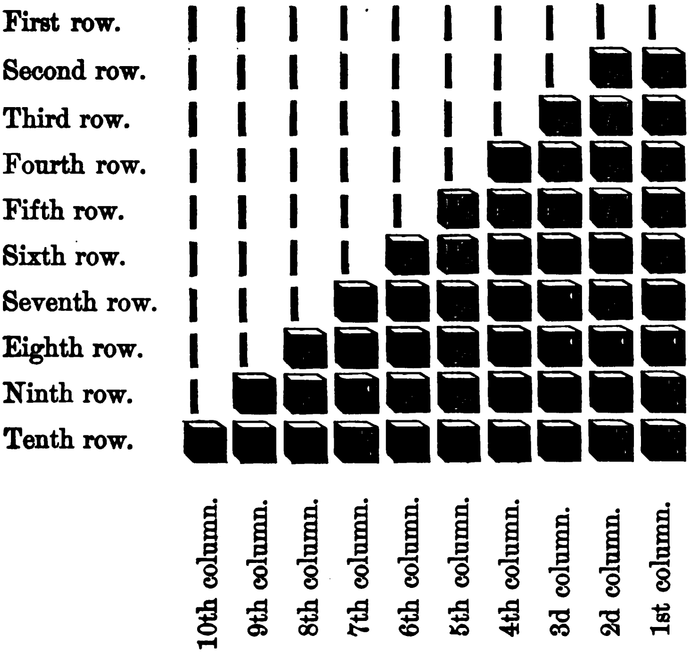
Nine ducks. 9
Ten doves. 10

Eight ducks and one duck are how many ducks?
Nine doves and one dove are how many doves?

II. Copy these words and figures ten times on your slate:



One 1. Three 3. Five 5. Seven 7. Nine 9.
Two 2. Four 4. Six 6. Eight 8. Ten 10.



III.

How many blocks are there in the

1. Third row?
2. Fifth row?
3. Second row?
4. Fourth row?
5. Seventh row?
6. Ninth row?
7. First row?
8. Tenth row?
9. *Sixth* column?
10. *Fifth column?*

How many marks are there in the

1. Seventh row?
2. Third row?
3. Fourth row?
4. Ninth row?
5. First row?
6. Fifth row?
7. Second row?
8. Sixth column?
9. Fifth column?
10. Tenth row?

How many marks and how many blocks in the

1. First column?
2. Tenth column?
3. Third column?
4. Seventh column?
5. Fourth column?
6. Second column?
7. Ninth column?
8. Eighth column?
9. Sixth row?
10. Eighth row?

IV. A **unit** is *one* of any kind; as, one ball, one house, one cent, one.

A **number** is a unit, or two or more units; as, one chair, five trees, one, three, seven.

1. In the number six balls are how many units or ones? In the number four tops? In eight hoops?

2. In the number three are how many units or ones? In the number ten? In the number one?

3. The number five is how many units or ones? The number seven? The number nine?

4. How many units or ones are there in the number 4? In the number 8? In 6? In 2?

5. 8 men are how many ones? 5 birds are how many ones? 3 books are how many ones?

V. Numbers are expressed by words, by figures, and by letters.

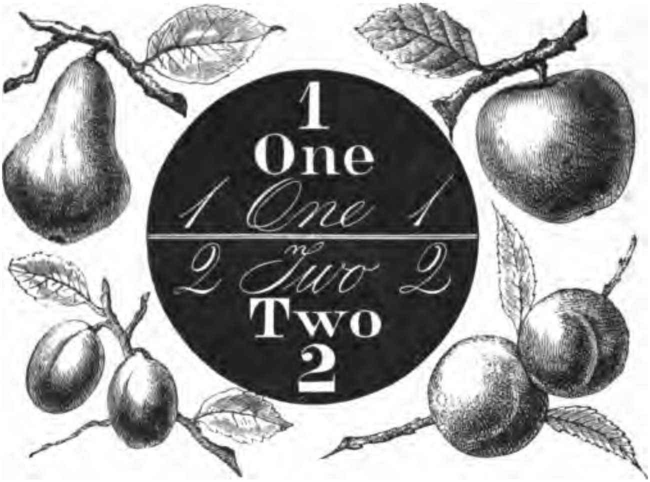
WORDS.	FIGURES.	LETTERS.	WORDS.	FIGURES.	LETTERS.
One	1	I	Six	6	VI
Two	2	II	Seven	7	VII
Three	3	III	Eight	8	VIII
Four	4	IV	Nine	9	IX
Five	5	V	Ten	10	X

The figure 0 means not any, or nothing; it is called *a cipher*, *naught*, or *zero*.

How many figures are used to write ten? What are they? Where is the 0 placed?

VI. Put this work on your slate, and read it in class:

WRITE IN FIGURES AND IN LETTERS				WRITE IN WORDS			
One	Eight	Five	Three	7	6	2	10
Six	Four	Eight	Ten	3	2	5	7
Two	Nine	Two	Seven	9	8	9	1
Seven	Five	Nine	One	5	10	6	5
Three	Ten	Six	Four	1	4	3	8



One. 1. Show me one hand; one slate; one book.

2. How many pears do you see in the picture?

I see one pear in the picture.

3. How many apples do you see in the picture?

4. How many stems has the apple?

5. How many stems has the pear?

6. Make one mark on your slate. Thus, |

7. Once one mark is how many marks?

8. Erase one mark. How many marks remain?

9. One mark from one mark leaves how many marks?

Two.—**I. Induction.**

1. Hold up two fingers; two hands; two books.

2. How many plums do you see in the picture? How many peaches?

3. Count two boys. Thus: **One boy, two boys.**

4. Count two girls; two desks; two books; two leaves.

5. On your slate make one mark; then make one more mark. How many marks have you made?

6. One mark and one mark are how many marks? Then, two times one mark are how many marks?

7. Erase one mark; erase one more mark. How many marks have you erased? How many marks remain?

8. One mark and one mark from two marks leave how many marks?

9. How many times can you take one mark from two marks? Then, how many times is one mark contained in two marks?

10. Two marks are how many times one mark?

II. Measuring 2.

a. *Measuring by* 1. | | 1 1

How many eggs are

1. 1 egg and 1 egg?
2. 2 times 1 egg?
3. 2 eggs less 1 egg, less 1 egg?
4. 2 eggs less 2 times 1 egg?
5. How many times can I take 1 egg from 2 eggs?
6. Then, how many times is 1 egg contained in 2 eggs?
7. 2 eggs are how many times 2 eggs?
8. 2 eggs are 2 times how many eggs?

b. *Equal parts.*—1 half. | : | 1

1. How many times can I take 2 plums from 2 plums?
2. Then, how many times are 2 plums contained in 2 plums?
3. How many plums is 1 half of 2 plums?
4. What part of 2 plums is 1 plum?
5. 1 plum is 1 half of how many plums?

III. Comparing 1 and 2.

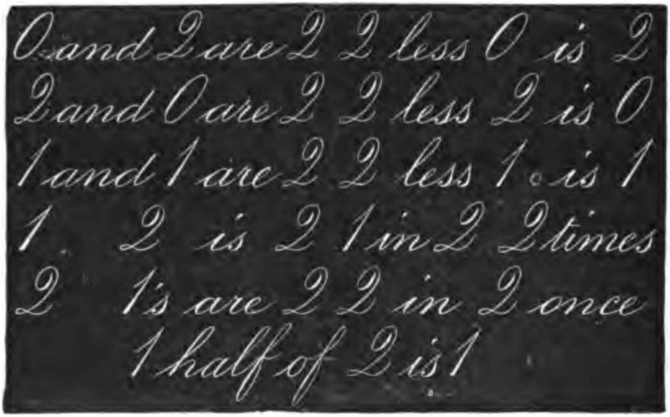
1. 2 is how many more than 1?
2. 2 is how many 1's? 2 is how many times 1?
3. 1 is how many less than 2?
4. *1 is what* part of 2?

IV. Combining the numbers 1 and 2.

1. 2 is twice how many? 2 is the double of how many?
2. 1 and 1 are how many?
3. Two 1's, or 2 times 1, are how many?
4. 1 is 1 half of how many?

V. On your slate, copy five times, and then learn and recite the

Table of 2.



0 and 2 are 2 2 less 0 is 2
2 and 0 are 2 2 less 2 is 0
1 and 1 are 2 2 less 1 is 1
1 2 is 2 1 in 2 2 times
2 1's are 2 2 in 2 once
1 half of 2 is 1

VI. Applying the numbers 1 and 2.

1. Mary picked one red pink, and one white one. How many pinks did she pick?

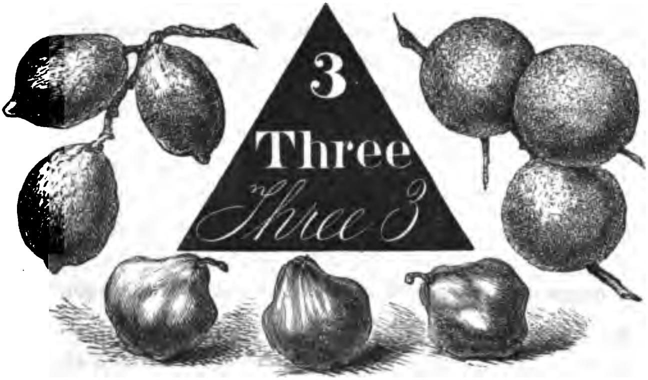
2. A boy who had two knives, sold one and lost one. How many knives had he left?

3. If a fig costs 1 cent, how many cents will 2 figs cost?

4. James had two balls, but he lost one of them. How many balls had he left?

5. At 1 cent each, how many tops can I buy for 2 cents?

6. Katie had 1 cent, and her mother gave her 1 more. If a lead-pencil costs 2 cents, how many pencils can she buy with her money?



I. Induction.

1. Show me three slates; three pencils; three knives.

2. In the picture are how many oranges? How many lemons? How many quinces? How many kinds of fruit?

3. Count three boxes; three pens; three windows.

4. On your slate make two marks; then make one more mark. How many marks have you made?

5. One mark, and one mark, and one mark are how many marks? Then, three times one mark are how many marks?

6. Erase two marks, and then erase one more mark. How many marks have you erased? How many marks remain?

7. One mark, and one mark, and one mark from three marks leave how many marks?

8. How many times can you take one mark from three marks? Then, three marks are how many times one mark?

II. Measuring 3.

a. *Measuring by* 1. | | | 1 1 1

How many tops are

1. 1 top, and 1 top, and 1 top?

2. 3 times 1 top?

3. 3 tops less 1 top, less 1 top, less 1 top?

4. 3 tops less 3 times 1 top?

5. How many times can you take 1 top from 3 tops?
6. Then, how many times is 1 top contained in 3 tops?

b. *Measuring by* 2. | | | 2 1

How many hoops are

1. 2 hoops and 1 hoop?
2. 1 hoop and 2 hoops?
3. 3 hoops less 2 hoops?
4. 3 hoops less 1 hoop?
5. How many times can I take 2 hoops from 3 hoops?
6. How many times are 2 hoops contained in 3 hoops?

2 hoops are contained in 3 hoops once, and 1 hoop over.

c. *Equal parts.*—1 third. | ⋮ | ⋮ | 1

1. How many times can I take 3 balls from 3 balls?
2. Then, how many times are 3 balls contained in 3 balls?
3. How many balls is 1 third of 3 balls?
4. What part of 3 balls is 1 ball?
5. 1 ball is 1 third of how many balls?

III. Copy five times on your slate, put the right number in the place of each —, and then learn and recite the

Table of 3.

0 *and* 3 *are* —
3 *and* 0 *are* —
1 *and* 2 *are* —
2 *and* 1 *are* —
1 3 *is* —
3 1'*s are* —

3 *less* 0 *is* —
3 *less* 3 *is* —
3 *less* 1 *is* —
3 *less* 2 *is* —
3 *in* 3 ——
1 *in* 3 — *times*

1 *third of* 3 *is* —

IV. Comparing 1 and 2 with 3.

1. 3 is how many more than 2? How many more than 1?
2. 2 is how many less than 3?
3. 1 is how many less than 3?
4. 3 is how many 1's? How many 2's?
5. *3 is* how many times 1? How many times 2?
6. *1 is what part of 3?* 1 is 1 third of what number?

1 and 1 are *equal* numbers; so are 2 and 2, or 3 and 3. But 1 and 2, or 1 and 3, or 2 and 3, are *unequal* numbers.

7. Of what equal numbers does 3 consist? Of what unequal numbers?

V. Combining the numbers 1—3.

1. 3 is 3 times what number? 3 is how many 1's?
2. From what number can I take two 1's, and have 1 left?
3. What number must I double, to have one less than 3?
4. 1 is 1 third of what number?
5. What number is 2 more than 1?
6. 3 is how many more than 1 third of 3?
7. 3 less 1 third of 3 is how many times 2?
8. 1 half of 2 is what part of 3?
9. 1 third of 3 is what part of 2?

VI. Applying the numbers 1, 2, 3.

1. In a vase are 1 white rose, 1 red one, and 1 yellow one. How many roses are in the vase?

2. If I take away 2 roses, how many will be left?

3. Levi wrote 1 line on his slate, and his sister wrote 2 lines. How many lines did both of them write?

4. How much will 3 pencils cost, at 1 cent apiece?

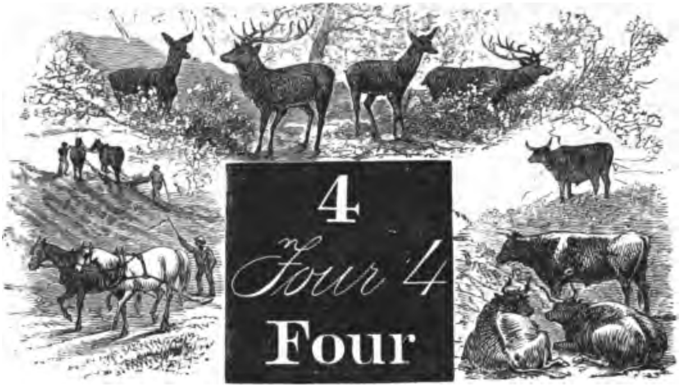
5. In a room are 3 lamps, and 1 of them has no shade. How many of the lamps have shades?

6. If I take 3 lamps from the room, how many lamps will remain?

7. To how many boys can I give 3 pears, if I give them 1 pear apiece?

8. If I give 3 figs to 3 girls, what part of 3 figs will 1 girl have? How many figs will 1 girl have?

9. Ella wishes to give 3 violets to her father and mother, and to give just as many to one of them as to the other. How many can she give to each; and how many will she have *left?*



I. Induction.

1. Show me four leaves in your book. Show me four pages. Four lines.

2. How many horses are shown in the picture? How many oxen? How many deer?

3. Count the four edges of the top of the table. Count the four corners. The four legs.

4. On your slate make three marks; then make one more mark. How many marks have you made?

5. One mark, and one mark, and one mark, and one mark are how many marks? Then, four times one mark are how many marks?

6. Erase three marks; then erase one more mark. How many marks have you erased? How many marks remain?

7. One mark, and one mark, and one mark, and one mark from four marks leave how many marks?

8. How many times can you take one mark from four marks? Then, how many times is one mark contained in four marks?

9. Four marks are how many times one mark?

II. Measuring 4.

a. *Measuring by* 1. | | | | 1 1 1 1

How many saws are

1. 1 saw, and 1 saw, and 1 saw, and 1 saw?
2. 4 times 1 saw?
3. 4 saws less 1 saw, less 1 saw, less 1 saw, less 1 saw?
4. 4 saws less 4 times 1 saw?
5. How many times can I take 1 saw from 4 saws?
6. Then, how many times is 1 saw contained in 4 saws?

b. *Measuring by* 2. | | | | 2 2

How many axes are

1. 2 axes and 2 axes?
2. 2 times 2 axes?
3. 4 axes less 2 axes, less 2 axes?
4. 4 axes less 2 times 2 axes?
5. How many times can I take 2 axes from 4 axes?
6. Then, how many times are 2 axes contained in 4 axes?
7. 4 axes are how many times 2 axes?
8. 4 axes are 2 times how many axes?

c. *Measuring by* 3. | | | | 3 1

How many hoes are

1. 3 hoes and 1 hoe?
2. 1 hoe and 3 hoes?
3. 4 hoes less 3 hoes?
4. 4 hoes less 1 hoe?
5. How many times can I take 3 hoes from 4 hoes?
6. Then, how many times are 3 hoes contained in 4 hoes?

d. *Equal parts.*—1 half, 1 fourth. | | : | : | 2 1

1. How many times can I take 4 rakes from 4 rakes?
2. Then, how many times are 4 rakes contained in 4 rakes?

How many rakes are

3. 1 half of 4 rakes?
4. 1 fourth of 4 rakes?

What part of 4 rakes

5. Are 2 rakes?
6. Is 1 rake?
7. 1 rake is 1 fourth of how many rakes?
8. 2 rakes are 1 half of how many rakes?

III. Write and complete, and then learn and recite the

Table of 4.

0 *and* 4 *are* —
4 *and* 0 *are* —
1 *and* 3 *are* —
3 *and* 1 *are* —
2 *and* 2 *are* —
1 4 *is* —
4 1's *are* —
2 2's *are* —
1 *half of* 4 *is* —

4 *less* 0 *is* —
4 *less* 4 *is* —
4 *less* 1 *is* —
4 *less* 3 *is* —
4 *less* 2 *is* —
4 *in* 4 ——
1 *in* 4 — *times*
2 *in* 4 — *times*
1 *fourth of* 4 *is* —

IV. Comparing 1, 2, 3 with 4.

1. 4 is how many more than 3? Than 2? Than 1?
2. 3 is how many less than 4?
3. 2 is how many less than 4? 1 is how many less?
4. 4 is how many 1's? How many 2's? 3's?
5. 4 is how many times 1? How many times 2? 3?
6. 1 is what part of 4? 2 is what part of 4?
7. Of what equal numbers does 4 consist? Of what unequal numbers?

V. Combining the numbers 1—4.

1. 2 is 1 half of how many? 2 times 2 is how many?
2. 1 is 1 fourth of what number?
3. What number is 3 more than 1?
4. 4 is how many more than 1 half of 4?
5. 3 less 1 half of 4 is how many times 1?
6. 4 less 2 times 1 is how many times 2?
7. If you take 1 from 3, what part of 4 will remain?
8. 1 third of 3 is what part of 4?
9. 1 fourth of 4 is what part of 3?

VI. Applying the numbers 1—4.

1. On the floor under the table are 3 balls, and under a chair is 1 ball. How many balls are on the floor?

2. On the table were 4 books; but Emma has taken away 1, Janet 1, and Harry 1. How many books are on the table?

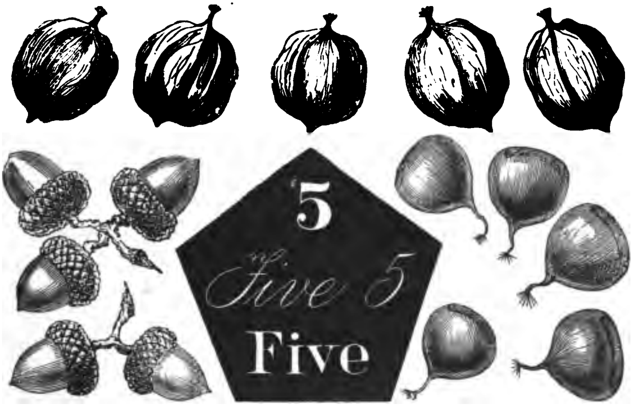
3. At 3 cents apiece, how many peaches can I buy for 4 cents? How many cents will I have left?

4. Levi bought a top for 2 cents, which was 1 half of his money. How much money had he?

5. How many horses are 2 pairs of horses?

6. A man works for 1 dime an hour. How many hours must he work to earn 4 dimes?

7. If I have 1 marble, and find 1, and then buy 2, how many marbles will I have?



I. Induction.

1. Show me five pictures. Five words. Five letters.

2. How many sides has the black part of this picture? How many corners has it?

3. Count five acorns. Five chestnuts. Five walnuts.

4. On your slate make four marks; then make one more mark. How many marks have you made?

5. One mark, and one mark, and one mark, and one mark, and one mark are how many marks?

6. Five times one mark are how many marks?

7. Erase four marks, and then erase one more mark. How many marks have you erased? . How many marks remain?

8. One mark, and one mark, and one mark, and one mark, and one mark, from five marks, leave how many marks?

9. How many times can you take one mark from five marks? Then, how many times is one mark contained in five marks?

10. Five marks are how many times one mark?

II. Measuring 5.

a. *Measuring by* 1. | | | | | 1 1 1 1 1

How many guns are

1. 1 gun, and 1 gun, and 1 gun, and 1 gun, and 1 gun?

2. 5 times 1 gun?

3. 5 guns less 1 gun, less 1 gun, less 1 gun, less 1 gun, less 1 gun?

4. 5 guns less 5 times 1 gun?

5. How many times can I take 1 gun from 5 guns?

6. Then, how many times is 1 gun contained in 5 guns?

b. *Measuring by* 2. | | | | | 2 2 1

1. How many flags are 2 flags, and 2 flags, and 1 flag?
2. How many flags are 2 times 2 flags and 1 flag?
3. How many flags are 5 flags less 2 flags, less 2 flags?
4. How many flags are 5 flags less 2 times 2 flags?
5. How many times can I take 2 flags from 5 flags?
6. Then, how many times are 2 flags contained in 5 flags?

c. *Measuring by* 3. | | | | | 3 2

How many fifes are

1. 3 fifes and 2 fifes?

2. 2 fifes and 3 fifes?

3. 5 fifes less 3 fifes?

4. 5 fifes less 2 fifes?

5. How many times can I take 3 fifes from 5 fifes?
6. Then, how many times are 3 fifes contained in 5 fifes?

d. *Measuring by* 4. | | | | | 4   1

How many drums are

1. 4 drums and 1 drum?
2. 1 drum and 4 drums?
3. 5 drums less 4 drums?
4. 5 drums less 1 drum?
5. How many times can I take 4 drums from 5 drums?
6. How many times are 4 drums contained in 5 drums?

e. *Equal parts.*—1 fifth. | : | : | : | : | 1

1. How many times can I take 5 bells from 5 bells?
2. How many times are 5 bells contained in 5 bells?
3. 1 fifth of 5 bells are how many bells?
4. 1 bell is 1 fifth of how many bells?
5. 1 bell is what part of 5 bells?

III. Write and complete, and then learn and recite the

Table of 5.

0 *and* 5 *are* —
5 *and* 0 *are* —
1 *and* 4 *are* —
4 *and* 1 *are* —
2 *and* 3 *are* —
3 *and* 2 *are* —
1 5 *is* —
5 1's *are* —

5 *less* 0 *is* —
5 *less* 5 *is* —
5 *less* 1 *is* —
5 *less* 4 *is* —
5 *less* 2 *is* —
5 *less* 3 *is* —
5 *in* 5 ——
1 *in* 5 — *times*

1 *fifth of* 5 *is* —

IV. Comparing 1, 2, 3, 4 with 5.

1. 5 is how many more than 4? Than 3? Than 2? Than 1?
2. 4 is how many less than 5? 3 is how many less? 2? 1?
3. 5 is how many 1's? How many 2's? 3's? 4's?
4. 5 is how many times 1? How many times 2? 3? 4?
5. 1 is what part of 5?
6. 1 fifth of 5 is how many?
7. Of what equal numbers does 5 consist? Of what unequal *numbers?*

V. Combining the numbers 1—5.

1. 5 is 3 more than what number?
2. 2 is how many less than 5?
3. 5 is how much more than 2 times 2?
4. What number is 1 more than 4?
5. 5 is how many more than 1 third of 3?
6. 5 less 1 is how many times 2?
7. What number is 3 more than 1 half of 4?
8. If you take 3 from 5, what part of 4 will remain?
9. 1 half of 2 is what part of 5?
10. 5 is 1 more than 2 times what number?

VI. Applying the numbers 1—5.

1. Florence brought some roses to school. She gave 3 of them to her teacher, and had 2 left. How many roses did she bring to school?

2. There are 5 school-days in a week. If Frank is absent 2 days, how many days is he in school?

3. I bought 1 can of cherries, 2 cans of plums, and 1 can of peaches. How many cans of fruit did I buy?

4. If a farm-hand can hoe 1 row of corn in 1 hour, in how many hours can he hoe 5 rows?

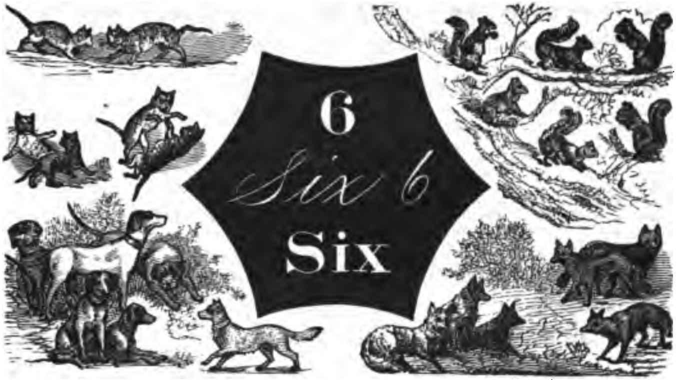
5. How many dollars will 5 lamps cost, at 1 dollar apiece?

6. In the front of a house are 5 windows, and 3 of them are in the upper story. How many are in the lower story?

7. Lucy had five birds, and she gave away 1 fifth of them. How many birds did she give away?

8. A boy went to the store with 5 cents to buy lemons at 2 cents apiece. How many lemons could he buy? How many cents would he have left?

9. I wish to give 5 peaches to 3 children. If I give 1 peach to 1 of the children, how many peaches can I give to each of the other 2?



I. Induction.

1. Show me the picture of six kittens. Of six squirrels.

2. How many dogs are shown in the picture? How many foxes?

3. Count six sticks. Six pins. Six fingers.

4. On your slate make five marks; then make one more mark. How many marks have you made?

5. One mark, and one mark, and one mark, and one mark, and one mark, and one mark are how many marks?

6. 6 times one mark are how many marks?

7. Erase five marks; then erase one more mark. How many marks have you erased? How many marks remain?

8. How many times can you take one mark from six marks?

9. How many times is one mark contained in six marks?

10. Six marks are how many times one mark?

II. Measuring 6.

a. *Measuring by* 1. | | | | | | 1 1 1 1 1 1

How many cups are

1. 5 cups and 1 cup?
2. *6 times 1 cup?*
3. 6 cups less 5 cups, less 1 cup?
4. 6 cups less 6 times 1 cup?

5. How many times can I take 1 cup from 6 cups?
6. Then, how many times is 1 cup contained in 6 cups?

b. *Measuring by* 2. | | | | | | 2 2 2

How many knives are

1. 2 knives, and 2 knives, and 2 knives?
2. 3 times 2 knives?
3. 6 knives less 2 knives, less 2 knives, less 2 knives?
4. 6 knives less 3 times 2 knives?
5. How many times can I take 2 knives from 6 knives?
6. How many times are 2 knives contained in 6 knives?
7. 6 knives are how many times 2 knives?
8. 6 knives are 3 times how many knives?

c. *Measuring by* 3. | | | | | | 3 3

How many forks are

1. 3 forks and 3 forks?
2. 2 times 3 forks?
3. 6 forks less 3 forks, less 3 forks?
4. 6 forks less 2 times 3 forks?
5. How many times can I take 3 forks from 6 forks?
6. How many times are 3 forks contained in 6 forks?
7. 6 forks are how many times 3 forks?
8. 6 forks are 2 times how many forks?

d. *Measuring by* 4. | | | | | | 4 2

How many mugs are

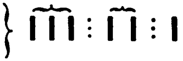
1. 4 mugs and 2 mugs?
2. 2 mugs and 4 mugs?
3. 6 mugs less 4 mugs?
4. 6 mugs less 2 mugs?
5. How many times can I take 4 mugs from 6 mugs?
6. How many times are 4 mugs contained in 6 mugs?

e. *Measuring by* 5. | | | | | | 5 1

How many plates are

1. 5 plates and 1 plate?
2. 1 plate and 5 plates?
3. 6 plates less 5 plates?
4. 6 plates less 1 plate?
5. How many times can I take 5 plates from 6 plates?
6. How many times are 5 plates contained in 6 plates?

II. *Equal parts.*—1 half; 1 third; 1 sixth.



3 2 1

1. How many times can I take 6 spoons from 6 spoons? Then, how many times are 6 spoons contained in 6 spoons?

How many spoons are	What part of 6 spoons
2. 1 half of 6 spoons?	5. Are 3 spoons?
3. 1 third of 6 spoons?	6. Are 2 spoons?
4. 1 sixth of 6 spoons?	7. Is 1 spoon?

8. 1 spoon is 1 sixth of how many spoons?
9. 2 spoons are 1 third of how many spoons?
10. 3 spoons are 1 half of how many spoons?

III. Write and complete, and then learn and recite the

Table of 6.

0 *and* 6 *are* —
6 *and* 0 *are* —
1 *and* 5 *are* —
5 *and* 1 *are* —
2 *and* 4 *are* —
4 *and* 2 *are* —
3 *and* 3 *are* —
1 6 *is* —
6 1's *are* —
2 3's *are* —
3 2's *are* —

6 *less* 0 *is* —
6 *less* 6 *is* —
6 *less* 1 *is* —
6 *less* 5 *is* —
6 *less* 2 *is* —
6 *less* 4 *is* —
6 *less* 3 *is* —
1 *in* 6 — *times*
6 *in* 6 ——
2 *in* 6 — *times*
3 *in* 6 — *times*

1 *half of* 6 *is* — 1 *third of* 6 *is* —
1 *sixth of* 6 *is* —

IV. Comparing 1, 2, 3, 4, 5 with 6.

1. 6 is how many more than 5? Than 4? 3? 2? 1?
2. How many less than 6 is 5? Is 4? Is 3? Is 2? Is 1?
3. 6 is how many 1's? How many 2's? 3's? 4's? 5's?
4. 1 is what part of 6? 2 is what part? 3 is what part?
5. Of what equal numbers does 6 consist? Of what un*equal numbers*?

V. Combining the numbers 1—6.

2, 4, 6, 8, and 10 are *even numbers;* and
1, 3, 5, 7, and 9 are *odd numbers.*

1. 6 is equal to what two even numbers? To what two odd numbers? To what three even numbers?

2. 6 is 2 times what odd number? 3 times what even number?

3. What number is 2 more than 4 times 1?

4. 1 half of 4 is what part of 6?

5. 6 less 1 half of 4 is how many times 2?

6. 1 half of 6 and 1 third of 6 is how many times 4?

7. 6 is equal to what three unequal numbers?

VI. Applying the numbers 1—6.

1. Ellen has 5 blocks in her lap, and 1 block upon a chair. How many blocks has she?

2. If I have 5 blocks, and give away 1 block, how many blocks will I have left?

3. A man had 6 horses, and sold 2 of them. How many pairs of horses had he left?

4. Reuben has 3 cages, with 2 squirrels in each cage. How many squirrels has he?

5. Ida had 6 plums, which she shared equally with her sister. What part of the 6 plums did each girl have? How many plums did each girl have?

6. Julia's hat cost 3 dollars, which was one half as much as her cloak cost. How much did her cloak cost?

7. If I divide 6 pears equally among 3 girls, what part of the 6 pears shall I give to each girl? How many pears shall I give to each girl?

8. Arthur lost 2 marbles, which were 1 third of all the marbles he had. How many marbles had he?

9. On 2 stems of three-leaved clover are how many *leaves?*

THE TERMS
ADD, MULTIPLY, SUBTRACT, DIVIDE.

I. When we say, "3 and 2 are 5," we unite or add the numbers 3 and 2.

a. To **add** numbers is to unite them.

1. Add 2 and 2. Add 1, 2, and 1.
2. Add the numbers 2, 1, and 3.
3. To 2 add 1, and then add 2. Add 2, and 2, and 2.

When we say, "2 and 2 and 2 are 6," or "3 2's are 6," or "3 times 2 are 6," we multiply the number 2 by the number 3.

b. To **multiply** a number is to add it to itself one or more times.

1. Multiply 3 by 2. Multiply 1 by 5.
2. Multiply 2 by 2. Multiply 1, 3, and 2 together.

When we say, "3 from 5 leaves 2," or "5 less 3 is 2," we take or subtract the number 3 from the number 5.

c. To **subtract** a number is to take it from another.

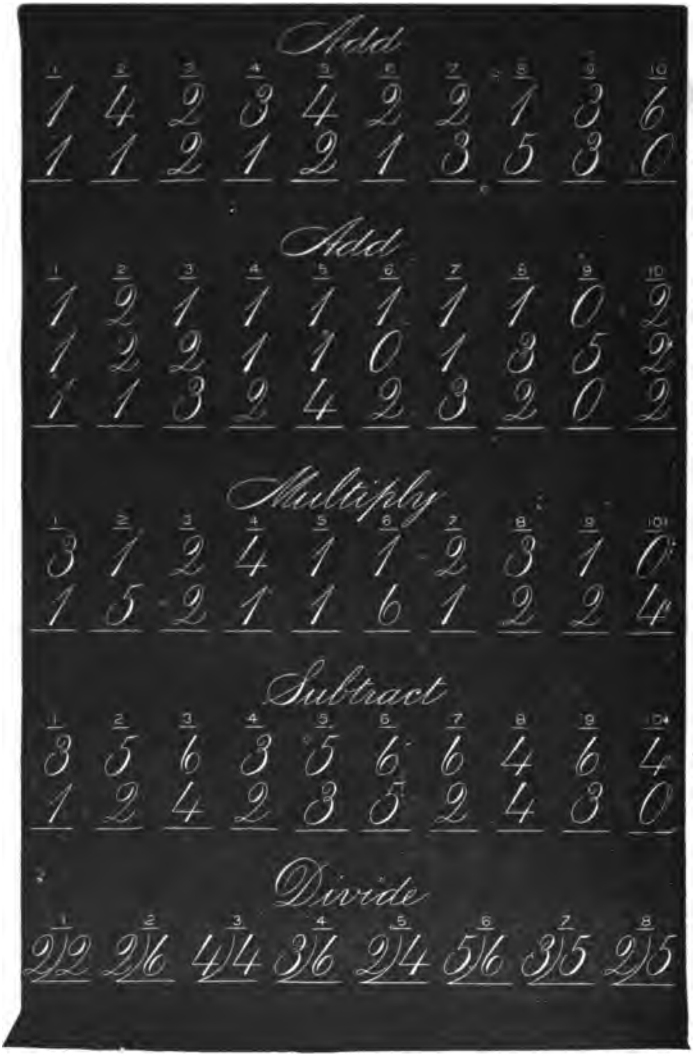
1. Subtract 4 from 6. Subtract 1 from 5.
2. From 4 subtract 3. From 5 subtract 2.
3. Subtract the number 3 from the number 6.

When we say, "3 is contained in 6 2 times," or "1 third of 6 is 2," we separate or divide the number 6 into 3 equal parts.

d. To **divide** a number is to separate it into equal parts.

1. Divide 4 by 2. Divide 6 by 3. Divide 6 by 2.
2. Find 1 third of 6. Find 1 half of 4. Find 1 fifth of 5.

II. Copy neatly on your slate, and complete all the exercises given on the next page.



Add

1	2	3	4	5	6	7	8	9	10
1	4	2	3	4	2	2	1	3	6
1	1	2	1	2	1	3	5	3	0

Add

1	2	3	4	5	6	7	8	9	10
1	2	1	1	1	1	1	1	0	2
1	2	2	1	1	0	1	3	5	2
1	1	3	2	4	2	3	2	0	2

Multiply

1	2	3	4	5	6	7	8	9	10
3	1	2	4	1	1	2	3	1	0
1	5	2	1	1	6	1	2	2	4

Subtract

1	2	3	4	5	6	7	8	9	10
3	5	6	3	5	6	6	4	6	4
1	2	4	2	3	5	2	4	3	0

Divide

1	2	3	4	5	6	7	8
2)2	2)6	4)4	3)6	2)4	5)6	3)5	2)5

THE SIGNS

+ × — ÷ =

I. **a.** When this mark or sign + is between two numbers, they are to be added.

This sign may be read *plus*, or *and*.

$2+4$ may be read "2 plus 4," or "2 and 4."

1. Read $3+2$ are 5; $5+1$ are 6; $2+4$ are 6.

2. Read $1+3+2$ are 6; $2+2+1$ are 5; $3+1+1+1$ are 6.

3. Put + in the proper place, and write on your slate, 1 and 4 are 5; 2 and 1 are 3; 3 and 3 are 6.

4. Write 3, and 2, and 1 are 6; 1, plus 3, plus 1 are 5; 1, plus 2, plus 1, plus 2 are 6.

b. When this sign × is between two numbers, they are to be multiplied together.

This sign may be read *times*, or *multiplied by*.

3×2 may be read "3 times 2," or "3 multiplied by 2."

1. Read 3×2 are 6; 4×1 are 4; $2\times3\times1$ are 6.

2. Put × in the proper place, and write on your slate, 2 times 3 are 6; 5 times 1 are 5; 2 times 2 are 4.

3. Write 3 multiplied by 2 are 6; 1 multiplied by 4 are 4; 3 multiplied by 1 multiplied by 2 are 6.

c. When this mark or sign — is between two numbers, the number after it is to be subtracted from the number before it.

This sign may be read *minus*, or *less*.

$5-3$ may be read "5 minus 3," or "5 less 3," or "3 from 5."

1. Read $5-2$ is 3; $6-4$ is 2; $4-3$ is 1.

2. Read $5-1$ is 4; $6-2$ is 4; $3-1$ is 2.

3. Put $-$ in the proper place, and write on your slate: 5 minus 4 is 1; 3 minus 1 is 2; 6 minus 3 is 3.

4. Write 4 less 2 is 2; 6 minus 1 is 5; 5 less 5 is 0.

5. 5 from 6 leaves 1; 4 from 4 leaves 0; 3 from 5 leaves 2.

d. When this sign $\div$ is between two numbers, the number before it is to be divided by the number after it.

This sign may be read *divided by*, or *is contained in*, or *in*. $6\div2$ may be read "6 divided by 2," or "2 is contained in 6," or "2 in 6."

1. Read $4\div2$ is 2
$6\div2$ is 3

2. Read $5\div5$ is 1
$6\div3$ is 2

3. Read $3\div1$ is 3
$2\div2$ is 1

Put $\div$ in the proper place, and write on your slate:

4. 6 divided by 3 is 2.
2 divided by 2 is 1.
4 divided by 2 is 2.

5. 6 is contained in 6 once.
2 is contained in 4 twice.
2 is contained in 6 3 times.

e. When this sign $=$ is between numbers, the number or set of numbers before it *equals* the one after it.

This sign may be read *equal*, or *are equal to*, or *are.* $3+2=5$ may be read "3 plus 2 equal 5," or "3 plus 2 are equal to 5," or "3 and 2 are 5."

1. Read
$2\times2=4$
$5\times1=5$
$3\times2=6$

2. Read
$4+1=5$
$2+3+1=6$
$1+1+2+1=5$

3. Read
$4-3=1$
$6-2=4$
$5-3=2$

4. Read
$6\div3=2$
$3\div3=1$
$4\div2=2$

II. Work to be written on the slate, with the proper signs:

3 plus 1 equal 4.
2 plus 4 are equal to 6.
3 and 2 are 5.
2 times 3 equal 6.
3 times 1 are 3.
2 multiplied by 2 is equal to 4.

5 minus 1 equals 4.
6 less 3 equals 3.
3 from 4 leaves 1.
4 divided by 2 equals 2.
3 is contained in 6 twice.
2 in 6 3 times.

USE OF TERMS AND SIGNS

a. 1. From 2 subtract 1, add 2, divide by 3, add 1, divide by 2, and multiply by 3.

2. How many are $3-1-1+2, \div 3$?

3. $1+1+1-2+1+1-2+1+1, \div 1 =$ how many?

4. $2\times 1, -1+2-1-1 =$ what number?

5. Add 1 and 1 and 1, subtract 2, add 1, divide by 2, multiply by 3, subtract 1, and divide by 2.

b. 1. $2\times 2-3+2, \times 1+1, -2\times 2$ are how many?

2. $4-1-2+1+1-2$ are how many less than 4?

3. $3-1, \times 2-3+1, \div 2, \times 4$ equal what number?

4. Add 3 and 1, divide by 2, add 2, subtract 3, add 1, divide by 2, and subtract 1.

c. 1. $5-2-3+2, \times 2, \div 2, \div 1, \times 5=$

2. $3+1, \div 2+1+2, \div 5, \times 3-1, \times 2$ are how many less than 5?

3. $2\times 2+1-3, \times 1\times 2-3+4, \div 5 =$ what number?

4. Multiply 2 by 2, subtract 3, add 2, divide by 3, add 3, divide by 2, subtract 1, and multiply by 5.

d. 1. $2+1+3-2, \div 2+1, \times 2 =$ how many?

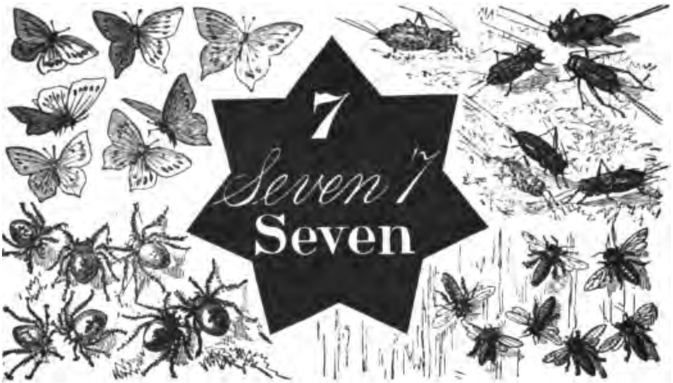
2. $5-2-1, \times 3, \div 2-1-1+2-1$ and how many $=6$?

3. $6-2-2-1, \times 4+1, \div 5+3+1+1-3+2=$

4. 4 minus 2, plus 3, plus 1, minus 4, divided by 2, plus 3, plus 2, divided by 3, multiplied by 2 is how many less than 6?

e. Exercises to be written and completed:

$2+2=$
$3+2=$
$2+3=$
$2\times 2=$
$2\times 3=$
$3\times 2=$
$4-2=$
$5-2=$
$5-3=$
$4\div 2=$
$6\div 2=$
$6\div 3=$



I. Induction.

1. Show me the picture of seven bees. Of seven butterflies.

2. How many spiders are shown in the picture? How many crickets?

3. Count the points of the star in the picture. Count the bees in the picture. Count the crickets.

4. On your slate make six marks; then make one more mark. How many marks have you made?

5. Six marks and one mark are how many marks?

6. Seven times one mark are how many marks?

7. Erase six marks, and then erase one more mark. How many marks have you erased? How many marks remain?

8. How many times can you take one mark from seven marks?

9. Then, how many times is one mark contained in seven marks?

10. Seven marks are how many times one mark?

II. Measuring 7.

a. *Measuring by* 1. | | | | | | | 1 1 1 1 1 1 1

How many beds are

1. 6 beds and 1 bed?
2. 7 times 1 bed?
3. 7 beds less 6 beds, less 1 bed?
4. 7 beds less 7 times 1 bed?
5. How many times can I take 1 bed from 7 beds?
6. Then, 7 beds are how many times 1 bed?

b. *Measuring by* 2. | | | | | | | 2 2 2 1

How many lamps are

1. 2 lamps, and 2 lamps, and 2 lamps, and 1 lamp?
2. 3 times 2 lamps and 1 lamp?
3. 7 lamps less 2 lamps, less 2 lamps, less 2 lamps?
4. 7 lamps less 3 times 2 lamps?
5. How many times can I take 2 lamps from 7 lamps?
6. Then, 7 lamps are how many times 2 lamps?

c. *Measuring by* 3. | | | | | | | 3 3 1

How many sofas are

1. 3 sofas, and 3 sofas, and 1 sofa?
2. 2 times 3 sofas and 1 sofa?
3. 7 sofas less 3 sofas, less 3 sofas?
4. 7 sofas less 2 times 3 sofas?
5. How many times can I take 3 sofas from 7 sofas?
6. Then, 7 sofas are how many times 3 sofas?

d. *Measuring by* 4. | | | | | | | 4 3

1. How many tables are 4 tables and 3 tables?
2. How many tables are 7 tables less 4 tables?
3. How many times can I take 4 tables from 7 tables?
4. Then, 7 tables are how many times 4 tables?

e. *Measuring by* 5. | | | | | | | 5 2

1. How many stools are 5 stools and 2 stools?
2. How many stools are 7 stools less 5 stools?

3. How many times can I take 5 stools from 7 stools?
4. Then, 7 stools are how many times 5 stools?

f. *Measuring by* 6. ❙ ❙ ❙ ❙ ❙ ❙   ❙   6 1

1. How many chairs are 6 chairs and 1 chair?
2. How many chairs are 7 chairs less 6 chairs?
3. How many times can I take 6 chairs from 7 chairs?
4. Then, 7 chairs are how many times 6 chairs?

g. *Equal parts.*—1 seventh. ❙:❙:❙:❙:❙:❙:❙   1

1. How many times can I take 7 curtains from 7 curtains?
2. How many times are 7 curtains contained in 7 curtains?
3. 1 seventh of 7 curtains are how many curtains?
4. 1 curtain is 1 seventh of how many curtains?
5. 1 curtain is what part of 7 curtains?

III. Write and complete, and then learn and recite the

Table of 7.

0 *and* 7 *are* —
7 *and* 0 *are* —
1 *and* 6 *are* —
6 *and* 1 *are* —
2 *and* 5 *are* —
5 *and* 2 *are* —
3 *and* 4 *are* —
4 *and* 3 *are* —
1   7 *is* —
7   1'*s are* —

7 *less* 0 *is* —
7 *less* 7 *is* —
7 *less* 1 *is* —
7 *less* 6 *is* —
7 *less* 2 *is* —
7 *less* 5 *is* —
7 *less* 3 *is* —
7 *less* 4 *is* —
1 *in* 7 — *times*
7 *in* 7 ——

1 *seventh of* 7 *is* —

IV. Comparing 1, 2, 3, 4, 5, 6 with 7.

1. 7 is how many more than 6? How many more than 5? Than 4? Than 3? Than 2? Than 1?

2. 6 is how many less than 7? 5 is how many less? 4? *3? 2? 1?*

3. 7 is how many 1's? How many 2's? 3's? 4's? 5's? 6's?

4. 7 is how many times 1? How many times 2? 3? 4? 5? 6?

5. 1 is what part of 7? 1 seventh of 7 is how many?

6. Of what equal numbers does 7 consist? Of what unequal numbers? Of what equal and unequal numbers?

7. What odd numbers can be combined to form 7?

V. Combining the numbers 1—7.

1. 1 from 7 leaves 2 times what number?
2. 7 less 1 half of 6 is how many times 2?
3. If I take 2 and 3 from 7, what number will remain?
4. What number is 3 more than 2 times 2?
5. How many times is 4 contained in 5 plus 2?
6. 2 times 3 from 4 plus 3 leaves what number?
7. $5+2-4, \times 2, \div 3+3, \div 5, \times 7, \div 4 =$ how many?
8. $3 \times 2-1, \div 1+2-1, \div 3-1, \times 7, \div 3$ is what number?
9. $7-4, \times 2, \div 3+1+1, \div 2, \times 3-4-1+6, \div 5=$
10. Multiply 3 by 2, subtract 5, add 2, add 4, subtract 1, divide by 3, multiply by 2, add 2, divide by 2, and add 4 times 1.

VI. Applying the numbers 1—7.

1. Charles gave 4 apples for a ball, and 3 for a bat. How many apples did he give for both?

2. Flora had 7 shells, but she lost 3 of them. How many shells has she now?

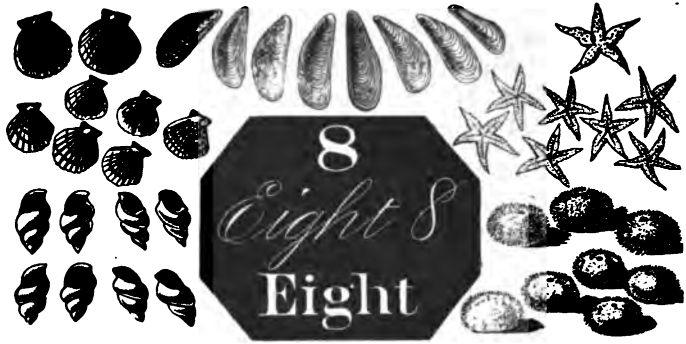
3. If I have 7 cents, how much money can I pay out for oranges at 3 cents apiece? What part of my money will I have left?

4. A ship has 3 masts, a brig has 2 masts, and a sloop has 1 mast. How many masts have 2 ships and a sloop?

5. How many masts have a ship and 2 brigs?

6. How many masts have a ship, a brig, and 2 sloops?

7. How many masts have 3 brigs and a sloop?



I. Induction.

1. Show me the picture of eight star-fish. Of eight scallops.

2. How many sides has the black part in the middle of the picture? How many corners?

3. Count eight sea-urchins; eight mussels; eight trumpet-shells.

4. On your slate make seven marks; then make one more mark. How many marks have you made?

5. Seven marks and one mark are how many marks?

6. Eight times one mark are how many marks?

7. Erase seven marks; then erase one more mark. How many marks have you erased? How many marks remain?

8. How many times can you take one mark from eight marks?

9. Then, how many times is one mark contained in eight marks?

10. Eight marks are how many times one mark?

II. Measuring 8.

a. *Measuring by* 1. | | | | | | | | 1 1 1 1 1 1 1 1

How many keys are

1. 7 keys and 1 key?
2. 8 times 1 key?
3. 8 keys less 7 keys, less 1 key?
4. 8 keys less 8 times 1 key?
5. How many times can I take 1 key from 8 keys?
6. Then, how many times is 1 key contained in 8 keys?

b. *Measuring by* 2. | | | | | | | | 2 2 2 2

How many locks are

1. 2 locks, and 2 locks, and 2 locks, and 2 locks?
2. 4 times 2 locks?
3. 8 locks less 2 locks, less 2 locks, less 2 locks, less 2 locks?
4. 8 locks less 4 times 2 locks?
5. How many times can I take 2 locks from 8 locks?
6. How many times are 2 locks contained in 8 locks?
7. 8 locks are how many times 2 locks?
8. 8 locks are 4 times how many locks?

c. *Measuring by* 3. | | | | | | | | 3 3 2

How many bolts are

1. 3 bolts, and 3 bolts, and 2 bolts?
2. 2 times 3 bolts, and 2 bolts?
3. 8 bolts less 3 bolts, less 3 bolts?
4. 8 bolts less 2 times 3 bolts?
5. How many times can I take 3 bolts from 8 bolts?
6. How many times are 3 bolts contained in 8 bolts?

d. *Measuring by* 4. | | | | | | | | 4 4

How many hinges are

1. 4 hinges and 4 hinges?
2. 2 times 4 hinges?
3. 8 hinges less 4 hinges, less 4 hinges?
4. 8 hinges less 2 times 4 hinges?

5. How many times can I take 4 hinges from 8 hinges?
6. How many times are 4 hinges contained in 8 hinges?
7. 8 hinges are how many times 4 hinges?
8. 8 hinges are 4 times how many hinges?

e. *Measuring by* 5. | | | | | | | | 5 3

1. How many tacks are 5 tacks and 3 tacks?
2. How many tacks are 8 tacks less 5 tacks?
3. How many times can I take 5 tacks from 8 tacks?
4. Then, how many times are 5 tacks contained in 8 tacks?

f. *Measuring by* 6. | | | | | | | | 6 2

1. How many nails are 6 nails and 2 nails?
2. How many nails are 8 nails less 6 nails?
3. How many times can I take 6 nails from 8 nails?
4. Then, how many times are 6 nails contained in 8 nails?

g. *Measuring by* 7. | | | | | | | | 7 1

1. How many boards are 7 boards and 1 board?
2. How many boards are 8 boards less 7 boards?
3. How many times can I take 7 boards from 8 boards?
4. Then, how many times are 7 boards contained in 8 boards?

h. *Equal parts.*—1 half; 1 fourth; 1 eighth. | | | | : | | : | : | 4 2 1

1. How many times can I take 8 bricks from 8 bricks? Then, how many times are 8 bricks contained in 8 bricks?

How many bricks are	What part of 8 bricks
2. 1 half of 8 bricks?	5. Are 4 bricks?
3. 1 fourth of 8 bricks?	6. Are 2 bricks?
4. 1 eighth of 8 bricks?	7. Is 1 brick?

8. 1 brick is 1 eighth of how many bricks?
9. 2 bricks are 1 fourth of how many bricks?
10. 4 bricks are 1 half of how many bricks?

III. Write, complete, learn, and recite the

Table of 8.

0 *and* 8 *are* —
8 *and* 0 *are* —
1 *and* 7 *are* —
7 *and* 1 *are* —
2 *and* 6 *are* —
6 *and* 2 *are* —
3 *and* 5 *are* —
5 *and* 3 *are* —
4 *and* 4 *are* —
1 8 *is* —
8 1'*s are* —
2 4'*s are* —
4 2'*s are* —

8 *less* 0 *is* —
8 *less* 8 *is* —
8 *less* 1 *is* —
8 *less* 7 *is* —
8 *less* 2 *is* —
8 *less* 6 *is* —
8 *less* 3 *is* —
8 *less* 5 *is* —
8 *less* 4 *is* —
1 *in* 8 — *times*
8 *in* 8 ——
2 *in* 8 — *times*
4 *in* 8 — *times*

1 *half of* 8 *is* — 1 *fourth of* 8 *is* —
1 *eighth of* 8 *is* —

IV. Comparing 1, 2, 3, 4, 5, 6, 7 with 8.

1. Compare 8 and 7.

8 is 1 more than 7; 7 is 1 less than 8.

2. Compare 8 and 6. 8 and 5. 8 and 4. 8 and 3. 8 and 2. 8 and 1.

3. 8 is how many 1's? 2's? 3's? 4's? 5's? 6's? 7's?

4. 8 is how many times 1? 2? 3? 4? 5? 6? 7?

5. 1 is what part of 8? 2 is what part? 4 is what part?

6. 8 is equal to what two equal numbers? To what four equal numbers? To what eight equal numbers?

7. 8 is equal to what two even numbers? To what two other even numbers? To what four even numbers?

8. 8 is equal to what two odd numbers? To what two other odd numbers?

9. 8 is equal to what two unequal numbers?

10. 8 is equal to what three unequal numbers?

V. Combining the numbers 1—8.

1. 8 is how many more than 3 times 2?

2. 8 less 5 is how many times 1?

3. How many times is 2 contained in 1 half of 8?

4. 8 is equal to 4 and 1 and how many?

5. How many are 2 times 2, plus 1 half of 4?

6. $8-5, \times 2-4, \times 3+1-3, \times 2, \div 3=$ how many?

7. $2+5+1, \div 2-1, \times 2, \div 3, \times 4-2-3+1, \times 2, \div 5$ is what number?

8. $3+1+2-4, \times 4-2, \div 3+5-1-4, \times 2, \div 4$ is what part of 8?

9. From 8 take 6, multiply by 2, add 4, subtract 2, divide by 3, add 4, add 2, and divide by 7.

VI. Applying the numbers 1—8.

1. Otis had 4 doves, and he bought 4 more. How many doves had he then?

2. If you have 8 cherries, and eat 7 of them, how many cherries will you then have?

3. On a bush were 8 roses, but Laura picked 3 of them. How many roses remained on the bush?

4. Two dogs have how many times as many feet as a boy?

5. How many boys can sit at 1 double desk? At 2 double desks? At 3? At 4?

6. For 8 cents, how many lemons can I buy at 3 cents apiece? How many at 4 cents apiece? At 5 cents apiece?

7. In a field 6 men are mowing, and 2 men are raking. What part of all the men are raking?

8. If 4 men leave the field, how many men will remain? What part of all the men will remain?

9. One half of the 8 pears on a tree dropped off. How many pears dropped off? How many pears remained on *the tree?*

WRITE AND ADD

1	2	3	4	5	6	7	8	9
7	0	5	4	2	1	7	4	3
1	8	2	3	6	6	0	4	5

WRITE AND MULTIPLY

1	2	3	4	5	6	7	8
7	2	0	1	4	1	0	8
1	4	8	7	2	8	7	1

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9
8	8	7	7	8	8	7	8	7
1	5	4	0	3	7	2	8	5

WRITE AND DIVIDE

1	2	3	4	5	6	7
1)7	2)8	7)7	4)8	2)7	3)8	3)7

WRITE AND ADD

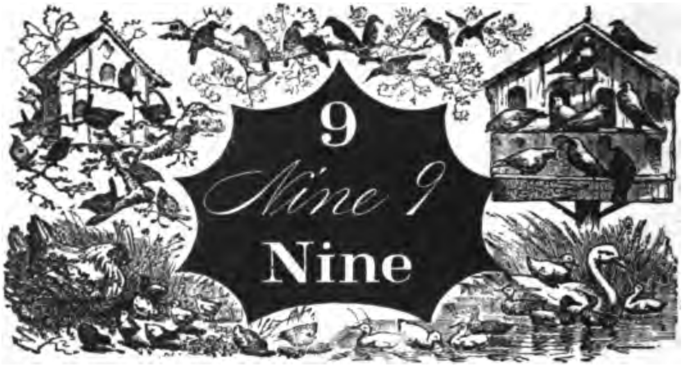
1	2	3	4	5	6	7	8	9	10
1	1	3	1	2	1	1	3	3	1
1	2	0	1	2	2	3	2	2	3
6	4	4	5	4	5	3	2	3	4

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9
8	7	7	8	8	7	8	0	7
4	1	3	0	7	7	6	7	6

WRITE AND DIVIDE

1	2	3	4	5	6	7
8)8	4)7	5)8	7)8	6)7	6)8	5)7



I. Induction.

1. In the picture show me nine wrens. Show me nine doves.

2. How many crows are shown in the picture?

3. Count the chickens in the picture. Count the ducks in the picture.

4. On your slate make eight marks; then make one more mark. How many marks have you made?

5. Eight marks and one mark are how many marks?

6. Nine times one mark are how many marks?

7. Erase eight of the nine marks; and then erase one more mark. How many marks have you erased? How many marks remain?

8. How many times can you take one mark from nine marks?

9. Then, how many times is one mark contained in nine marks?

10. Nine marks are how many times one mark?

II. Measuring 9.

a. *Measuring by* 1. | | | | | | | | | 1 1 1 1 1 1 1 1 1

How many tubs are

1. 8 tubs and 1 tub?
2. 9 times 1 tub?
3. 9 tubs less 8 tubs, less 1 tub?
4. 9 tubs less 9 times 1 tub?
5. How many times can I take 1 tub from 9 tubs?
6. Then, how many times is 1 tub contained in 9 tubs?

b. *Measuring by* 2. || || || || |
2 2 2 2 1

How many pans are

1. 2 pans, and 2 pans, and 2 pans, and 2 pans, and 1 pan?
2. 4 times 2 pans and 1 pan?
3. 9 pans less 2 pans, less 2 pans, less 2 pans, less 2 pans?
4. 9 pans less 4 times 2 pans?
5. How many times can I take 2 pans from 9 pans?
6. Then, how many times are 2 pans contained in 9 pans?

c. *Measuring by* 3. ||| ||| ||| 3 3 3

How many jars are

1. 3 jars, and 3 jars, and 3 jars?
2. 3 times 3 jars?
3. 9 jars less 3 jars, less 3 jars, less 3 jars?
4. 9 jars less 3 times 3 jars?
5. How many times can I take 3 jars from 9 jars?
6. Then, how many times are 3 jars contained in 9 jars?
7. 9 jars are how many times 3 jars?
8. 9 jars are 3 times how many jars?

d. *Measuring by* 4. |||| |||| | 4 4 1

How many jugs are

1. 4 jugs, and 4 jugs, and 1 jug?
2. 2 times 4 jugs and 1 jug?
3. 9 jugs less 4 jugs, less 4 jugs?
4. 9 jugs less 2 times 4 jugs?

5. How many times can I take 4 jugs from 9 jugs?
6. Then, how many times are 4 jugs contained in 9 jugs?

e. *Measuring by* 5. | | | | | | | | | 5   4

1. How many pails are 5 pails and 4 pails?
2. How many pails are 9 pails less 5 pails?
3. How many times can I take 5 pails from 9 pails?
4. Then, how many times are 5 pails contained in 9 pails?

f. *Measuring by* 6. | | | | | | | | | 6   3

1. How many bowls are 6 bowls and 3 bowls?
2. How many bowls are 9 bowls less 6 bowls?
3. How many times can I take 6 bowls from 9 bowls?
4. How many times are 6 bowls contained in 9 bowls?

g. *Measuring by* 7. | | | | | | | | | 7   2

1. How many boxes are 7 boxes and 2 boxes?
2. How many boxes are 9 boxes less 7 boxes?
3. How many times can I take 7 boxes from 9 boxes?
4. How many times are 7 boxes contained in 9 boxes?

h. *Measuring by* 8. | | | | | | | | | 8   1

1. How many brooms are 8 brooms and 1 broom?
2. How many brooms are 9 brooms less 8 brooms?
3. How many times can I take 8 brooms from 9 brooms?
4. How many times are 8 brooms contained in 9 brooms?

i. *Equal parts.*—1 third; 1 ninth. | | | : | | | : | | | 3   1

1. How many times can I take 9 baskets from 9 baskets?
2. How many times are 9 baskets contained in 9 baskets?

How many baskets are	What part of 9 baskets
3. 1 third of 9 baskets?	5. Are 3 baskets?
4. 1 ninth of 9 baskets?	6. Is 1 basket?

7. 1 basket is 1 ninth of how many baskets?

8. 3 baskets are 1 third of how many baskets?

III. Write, complete, learn, and recite the

Table of 9.

0 *and* 9 *are* —
9 *and* 0 *are* —
1 *and* 8 *are* —
8 *and* 1 *are* —
2 *and* 7 *are* —
7 *and* 2 *are* —
3 *and* 6 *are* —
6 *and* 3 *are* —
4 *and* 5 *are* —
5 *and* 4 *are* —
1 9 *is* —
9 1'*s are* —
3 3'*s are* —
1 *third of* 9 *is* —

9 *less* 0 *is* —
9 *less* 9 *is* —
9 *less* 1 *is* —
9 *less* 8 *is* —
9 *less* 2 *is* —
9 *less* 7 *is* —
9 *less* 3 *is* —
9 *less* 6 *is* —
9 *less* 4 *is* —
9 *less* 5 *is* —
1 *in* 9 — *times*
9 *in* 9 ——
3 *in* 9 — *times*
1 *ninth of* 9 *is* —

IV. Comparing 1, 2, 3, 4, 5, 6, 7, 8 with 9.

1. Compare 9 and 8. 9 and 7. 9 and 6. 9 and 5.
2. Compare 9 and 4. 9 and 3. 9 and 2. 9 and 1.
3. 9 is how many 1's? How many 2's? How many 3's? 4's? 5's? 6's? 7's? 8's?
4. 9 is how many times 1? How many times 2? How many times 3? 4? 5? 6? 7? 8?
5. 1 is what part of 9? 3 is what part of 9?
6. Of what equal numbers does 9 consist? Of what unequal numbers?
7. 9 is equal to what three odd numbers? To what three other odd numbers?

V. Combining the numbers 1—9.

1. 9 equals 5 and what number? 2 and what number?
2. 9 is how many more than 2 times 4?
3. How many times is 1 third of 9 contained in 3?

4. 7 minus 4 from 9 leaves how many times 5?

5. 3 times 1 half of 6 are how many times 4?

6. 9 less 1 third of 9 equals what two equal numbers? What 3 equal numbers?

7. $4\times2+1, \div3+2-1, \div2+7-3, \div2, \times3=$ how many?

8. $9\div3, \div3+5-4+2, \times2-5-2, \times3\times3, \div4=$

9. $5+4, \div3+4-6, \times2\times2\times2$ and how many $=3\times3$?

10. From 9 subtract 1, divide by 4, multiply by 2, add 5, subtract 3, divide by 3, and add 4.

VI. Applying the numbers 1—9.

1. A sleigh has 3 seats, and on each seat are 3 children. How many children are in the sleigh?

2. What part of all the children are on one seat?

3. How many children would remain in the sleigh, if 3 of them should get out?

4. How many would remain, if the children on 2 seats should get out?

5. Five of the children have yarn mittens, and the others have fur mittens. How many have fur mittens?

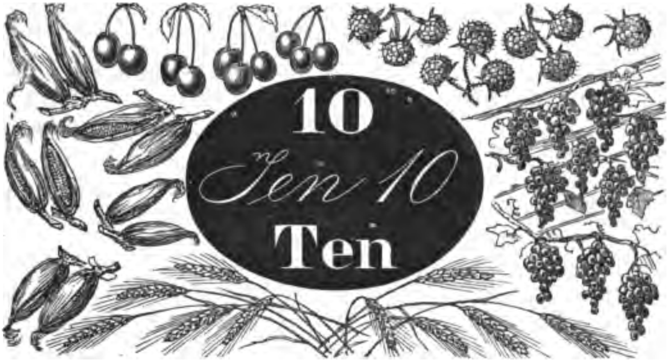
6. One day Joseph found 5 eggs in one nest, and 4 in another. How many eggs did he find?

7. A hunter shot 9 birds, and all but 2 of them were quails. How many quails did he shoot?

8. Hiram is 9 years old, and his sister Sarah is 4 years younger. How old is Sarah?

9. Anna had 9 chickens, but she has sold 7 of them. How many chickens has she now?

10. Amos has 2 marbles, James has twice as many as Amos, George has twice as many as James, and Ira has one more than George. How many marbles has James? How many has George? How many has Ira?



I. Induction.

1. In this picture find ten heads of barley. Find ten ears of corn.

2. How many cherries are shown in the picture? How many bunches of grapes are shown in the picture?

3. Count the raspberries in the picture.

4. On your slate make nine marks; then make one more mark. How many marks have you made?

5. Nine marks and one mark are how many marks?

6. Ten times one mark are how many marks?

7. Erase nine marks, and then erase one more mark. How many marks have you erased? How many marks remain?

8. How many times can you take one mark from ten marks?

9. Then, how many times is one mark contained in ten marks?

10. *Ten marks* are how many times one mark?

II. Measuring 10.

a. *Measuring by* 1. { I I I I I I I I I I
1 1 1 1 1 1 1 1 1 1

How many hats are

1. 9 hats and 1 hat?
2. 10 times 1 hat?
3. 10 hats less 9 hats, less 1 hat?
4. 10 hats less 10 times 1 hat?
5. How many times can I take 1 hat from 10 hats?
6. Then, how many times is 1 hat contained in 10 hats?

b. *Measuring by* 2. { II II II II II
2 2 2 2 2

1. How many gloves are 2 gloves, and 2 gloves, and 2 gloves, and 2 gloves, and 2 gloves?
2. 5 times 2 gloves?
3. 10 gloves less 2 gloves, less 2 gloves, less 2 gloves, less 2 gloves, less 2 gloves?
4. 10 gloves less 5 times 2 gloves?
5. How many times can I take 2 gloves from 10 gloves?
6. How many times are 2 gloves contained in 10 gloves?
7. 10 gloves are how many times 2 gloves?
8. 10 gloves are 5 times how many gloves?

c. *Measuring by* 3. III III III I 3 3 3 1

How many shoes are

1. 3 shoes, and 3 shoes, and 3 shoes, and 1 shoe?
2. 3 times 3 shoes and 1 shoe?
3. 10 shoes less 3 shoes, less 3 shoes, less 3 shoes?
4. 10 shoes less 3 times 3 shoes?
5. How many times can I take 3 shoes from 10 shoes?
6. How many times are 3 shoes contained in 10 shoes?

d. *Measuring by* 4. IIII IIII II 4 4 2

How many boots are

1. 4 boots, and 4 boots, and 2 boots?
2. 2 times 4 boots and 2 *boots?*
3. 10 boots less 4 boots, less 4 boots?
4. 10 boots less 2 times 4 boots?

5. How many times can I take 4 boots from 10 boots?
6. How many times are 4 boots contained in 10 boots?

e. *Measuring by* 5. ||||| ||||| 5 5

How many caps are

1. 5 caps and 5 caps?
2. 2 times 5 caps?
3. 10 caps less 5 caps, less 5 caps?
4. 10 caps less 2 times 5 caps?
5. How many times can I take 5 caps from 10 caps?
6. Then, how many times are 5 caps contained in 10 caps?
7. 10 caps are how many times 5 caps?
8. 10 caps are 5 times how many caps?

f. *Measuring by* 6. |||||| |||| 6 4

1. How many fans are 6 fans and 4 fans?
2. How many fans are 10 fans less 6 fans?
3. How many times can I take 6 fans from 10 fans?
4. Then, how many times are 6 fans contained in 10 fans?

g. *Measuring by* 7. ||||||| ||| 7 3

1. How many muffs are 7 muffs and 3 muffs?
2. How many muffs are 10 muffs less 7 muffs?
3. How many times can I take 7 muffs from 10 muffs?
4. How many times are 7 muffs contained in 10 muffs?

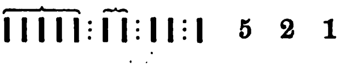
h. *Measuring by* 8. |||||||| || 8 2

1. How many combs are 8 combs and 2 combs?
2. How many combs are 10 combs less 8 combs?
3. How many times can I take 8 combs from 10 combs?
4. How many times are 8 combs contained in 10 combs?

i. *Measuring by* 9. ||||||||| | 9 1

1. How many coats are 9 coats and 1 coat?
2. How many coats are 10 coats less 9 coats?
3. How many times can I take 9 coats from 10 coats?
4. How many times are 9 coats contained in 10 coats?

j. *Equal parts.*—1 half; 1 fifth; 1 tenth.



1. How many times can I take 10 buttons from 10 buttons? Then, how many times are 10 buttons contained in 10 buttons?

How many buttons are	What part of 10 buttons
2. 1 half of 10 buttons?	5. Are 5 buttons?
3. 1 fifth of 10 buttons?	6. Are 2 buttons?
4. 1 tenth of 10 buttons?	7. Is 1 button?

8. 5 buttons are 1 half of how many buttons?
9. 2 buttons are 1 fifth of how many buttons?
10. 1 button is 1 tenth of how many buttons?

III. Write, complete, learn, and recite the

Table of 10.

10 *and* 0 *are* —
0 *and* 10 *are* —
1 *and* 9 *are* —
9 *and* 1 *are* —
2 *and* 8 *are* —
8 *and* 2 *are* —
3 *and* 7 *are* —
7 *and* 3 *are* —
4 *and* 6 *are* —
6 *and* 4 *are* —
5 *and* 5 *are* —
1 10 *is* —
10 1's *are* —
2 5's *are* —
5 2's *are* —

10 *less* 0 *is* —
10 *less* 10 *is* —
10 *less* 1 *is* —
10 *less* 9 *is* —
10 *less* 2 *is* —
10 *less* 8 *is* —
10 *less* 3 *is* —
10 *less* 7 *is* —
10 *less* 4 *is* —
10 *less* 6 *is* —
10 *less* 5 *is* —
1 *in* 10 — *times*
10 *in* 10 ——
2 *in* 10 — *times*
5 *in* 10 — *times*

1 *half of* 10 *is* — 1 *fifth of* 10 *is* —
1 *tenth of* 10 *is* —

IV. Comparing 1, 2, 3, 4, 5, 6, 7, 8, 9 with 10.

1. Compare 10 and 9. 10 and 8. 10 and 7. 10 and 6. 10 and 5. 10 and 4. 10 and 3. 10 and 2. 10 and 1.

2. 10 is how many 1's? How many 2's? How many 3's? 4's? 5's? 6's? 7's? 8's? 9's?

3. 10 is how many times 1? How many times 2? How many times 3? 4? 5? 6? 7? 8? 9?

4. 1 is what part of 10? 2 is what part? 5 is what part?

5. 10 is equal to what two even numbers? To what other two even numbers?

6. 10 is equal to what two odd numbers? To what other two odd numbers?

7. 10 is equal to what two equal numbers? To what five equal numbers?

8. 10 is the sum of three unequal numbers, one of which is 6. What are the other numbers?

9. 10 is the sum of three unequal numbers, one of which is 4. What are the other numbers?

10. 10 is the sum of what four unequal numbers?

V. Combining the numbers 1—10.

1. 9 minus 4, plus 3, and how many equal 10?

2. 10 less 2 is how many times 4?

3. 3 times 3, plus 1 third of 3, equal how many times 2? How many times 3?

4. If I take 2 times 4 from 10 less 2, how many will I have left?

5. 1 fifth of 10 is what part of 8? What part of 6? What part of 4?

6. 1 third of 3, plus 1 third of 6, plus 1 third of 9, are how many less than 10?

7. $6+4, \div 5+3\times 2-7\times 3-4$ is what part of 10?

8. $10-7, \times 3+1, \div 5, \times 4-6+4, \div 2+3$ is how many less than 10?

9. $2 \times 3+4, \div 2-2-2+1, \times 4, \div 2, \div 2, \times 5-4-3=$ what number?

10. Divide 10 by 5, add 1, multiply by 3, subtract 3, divide by 3, add 7, subtract 4, multiply by 2, subtract 2, divide by 4, multiply by 5, and divide by 7.

VI. Applying the numbers 1–10.

1. Of a class of 10 pupils, 7 had poor lessons. How many had good lessons?

2. A man chopped 10 logs, and drew away 6 of them. How many logs remained?

3. To how many boys can I give 10 chestnuts, if I give them 2 chestnuts apiece? If I give them 5 chestnuts apiece?

4. How can I divide 10 chestnuts among 3 boys? Among 4 boys? Among 5 boys?

5. One day a cooper made 4 flour barrels and 6 apple barrels, and sold 3 flour barrels and 2 apple barrels.

How many barrels did he make?
How many barrels did he sell?
How many barrels had he left?
What part of the 10 barrels had he left?

6. How many radishes are there in 2 bunches, if there are 5 radishes in each bunch?

7. A farmer having 10 turkeys, sold 1 half and 1 fifth of them. How many had he left?

8. In a lumber yard 2 men are at work in one place, and 4 times as many in another. How many men are at work in the yard?

9. Last year I used 3 tons of stove coal, 2 times as much chestnut coal, and 1 third as much pea coal. How many *tons of coal* did I use?

WRITE AND ADD

1	2	3	4	5	6	7	8	9	10
1	8	7	5	9	2	4	6	3	5
9	1	2	5	0	8	6	3	7	4

WRITE AND MULTIPLY

1	2	3	4	5	6	7	8	9
3	9	5	0	10	1	0	2	1
3	1	2	9	1	9	10	5	10

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9	10
9	9	10	9	10	10	9	10	9	10
6	2	6	8	3	1	0	5	4	9

WRITE AND ADD

1	2	3	4	5	6	7	8	9	10
1	2	1	5	6	1	3	1	5	3
2	1	0	2	3	4	2	4	2	3
6	7	9	2	1	4	4	5	3	3

WRITE AND DIVIDE

1	2	3	4	5	6	7	8
1)9	2)10	3)9	10)10	2)9	5)10	4)9	3)10

WRITE AND ADD

1	2	3	4	5	6	7	8	9	10
2	5	2	1	5	1	2	1	3	1
1	1	2	1	2	3	2	4	2	2
6	1	1	3	1	4	3	4	3	3
1	2	4	5	2	1	3	1	1	4

REVIEW

A. 1. Add by 2's, from 0 to 10. Thus:

Naught, two, four, six, eight, ten.

2. Subtract by 2's, from 10 to 0. Thus:

Ten, eight, six, four, two, naught.

Add

3. By 2's, from 1 to 9.
4. By 3's, from 0 to 9.
5. By 3's, from 1 to 10.
6. By 3's, from 2 to 8.

Subtract

7. By 2's, from 9 to 1.
8. By 3's, from 9 to 0.
9. By 3's, from 10 to 1.
10. By 3's, from 8 to 2.

B. 1. One half of 2 is how many?

One half of any number is the number divided by 2.
2 divided by 2 is 1; hence, 1 half of 2 is 1.

2. How many are 1 third of 3? 1 fourth of 4? 1 fifth of 5?

3. 1 half of 4 is —
4. 1 half of 6 is —
5. 1 half of 8 is —
6. 1 half of 10 is —

7. 1 third of 6 is —
8. 1 third of 9 is —
9. 1 fourth of 8 is —
10. 1 fifth of 10 is —

C. 1. 1 third of $3+1-2+3-1-1+2, \div 2 =$ how many?

2. $2 \times 5 = 4 + 3 +$ how many?

3. $2 \times 2 + 3 - 6, \times 4, \div 2 = 1$ fifth of what number?

4. To 3 add 2, subtract 4, add 5, and subtract 3.

5. What number is 4 less than 3 and 3 and 1?

6. From 6 subtract 4, add 3, subtract 2, add 1, and subtract 4.

7. 5 and 4 are how many times 1 half of 6?

D. 1. Before a stage-coach are 2 pairs of horses. How many horses are before the coach?

2. Lucy has 3 kittens, and Addie has 5. How many *kittens have the* two girls?

3. Five boys are skating, and two are sliding. How many more boys are skating than are sliding?

4. Eight boots are how many pairs of boots?

5. Ten gloves are how many pairs of gloves?

6. A gunsmith made 10 guns, and sold all but 1 fifth of them. How many guns did he sell?

7. Find the cost of 4 boxes of lemons, at 2 dollars a box.

8. If 5 tons of coal will last 5 months, what part of 5 tons will last 1 month? How many tons will last 1 month?

9. A man earns 10 dollars in a week, and his son earns 7 dollars less. How many dollars does his son earn?

E. What number will remain, if you take

1. From 3
   All the 2's?
2. From 5
   All the 2's?
   All the 3's?
   All the 4's?
3. From 7
   All the 2's?
   All the 3's?
   All the 4's?
   All the 5's?
   All the 6's?
4. From 4
   All the 3's?
5. From 6
   All the 4's?
   All the 5's?
6. From 9
   All the 2's?
   All the 4's?
   All the 5's?
   All the 6's?
   All the 7's?
   All the 8's?
7. From 8
   All the 3's?
   All the 5's?
   All the 6's?
   All the 7's?
8. From 10
   All the 3's?
   All the 4's?
   All the 6's?
   All the 7's?
   All the 8's?
   All the 9's?

F. 1. One is 1 half of what number?

Any number is 1 half of 2 times itself.

1 is 1 half of 2 times 1, or 2.

2. 1 is 1 third of what number? 1 is 1 fourth of what number? 1 is 1 fifth of what number?

3. 2 is 1 half of —
4. 3 is 1 half of —
5. 4 is 1 half of —
6. 5 is 1 half of —
7. 2 is 1 third of —
8. 3 is 1 third of —
9. 2 is 1 fourth of —
10. 2 is 1 fifth of —

G. 1. 1 half of 4, + 1 fourth of 4, − 1 third of 3, × 1 half of 4, ÷ 1 half of 2 are how many?

2. $4 \div 2 + 3 - 1, \div 2 - 1, \times 5 + 2, \div 3 =$ how many?

3. From $5+3$ take $5-3$, divide by $6-4$, add $7-2$, divide by 2×2, multiply by $5-1$, and subtract $2+3$.

4. What three odd numbers will you add, to form 7?

5. If I take 1 half of 6 and 1 fourth of 8 from 9, how many times 3 will remain?

6. Add 1 half of 2, 1 third of 3, 1 fourth of 4, and 1 fifth of 5; divide by 2 times 1; add 3 times 1; and subtract 1 half of 4.

7. 1 third of 6 and 1 fourth of 8, taken from 7, leave 1 half of what number?

H. On your slate, make a table of all the pairs of numbers that, when added, form 2, 3, 4, 5, 6, 7, 8, 9, and 10. Thus:

$2=1+1$;
$3=2+1$, or $1+2$;
$4=3+1$, or $2+2$, or $1+3$; and so on.

I. 1. 6 is how many 2's? How many 3's?

Any number is as many 2's as the times 2 is contained in the number.

2 in 6 3 times; hence, 6 is 3 2's.

2. 10 is how many 2's?
3. 4 is how many 2's?
4. 8 is how many 2's?
5. 9 is how many 3's?
6. 5 is how many 1's?
7. 8 is how many 4's?
8. 7 is how many 1's?
9. 10 is how many 5's?

J. 1. If you study 2 hours each school-day, how many hours do you study in a week?

2. How many wheels have 2 wagons?

3. Six girls are on the play-ground, and one third as many are standing in the door. How many girls are standing in the door?

4. A woman having 6 geese sold 1 half of them. How many geese did she sell? How many had she left?

5. Four persons are riding in a wagon, and one half as many on horseback. How many persons are riding?

6. What part of the 6 persons are on horseback?

7. If a writing-book costs 10 cents, and a pen-holder 4 cents less, how much does the pen-holder cost?

WRITE AND ADD

1	2	3	4	5	6	7	8	9	10
1	3	1	4	3	4	1	2	2	0
2	1	2	0	1	1	4	0	6	7
1	1	2	2	2	4	2	1	2	0
3	3	1	3	1	1	1	2	0	2

WRITE AND MULTIPLY

1	2	3	4	5	6	7	8	9	10
4	6	0	2	3	1	2	5	2	9
2	1	7	3	3	5	4	2	2	0

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9	10
7	10	8	9	9	8	10	5	10	9
3	2	4	0	5	1	3	5	0	2

WRITE AND DIVIDE

1	2	3	4	5	6	7	8
3)6	2)10	7)7	2)8	3)9	2)9	3)8	7)10

WRITE AND ADD

1	2	3	4	5	6	7	8	9	10
3	1	1	0	2	1	2	1	2	2
1	2	2	2	1	1	1	3	1	0
1	0	2	0	4	1	3	0	2	3
4	1	2	3	1	2	2	1	3	1
1	2	1	0	2	2	1	3	2	3

SUGGESTIONS TO TEACHERS

The table given on this page covers all the primary combinations in Addition. Before leaving this part of the book (pages 61–77), drill pupils thoroughly in these combinations, using this table, as follows:

On the board write the first nine numbers, in series, and under each number write the same number—4, for example. Then, pointing rapidly to different pairs of numbers, require pupil or class to give result instantly.

ADDITION TABLE OF PRIMARY COMBINATIONS.

1.	1	2	3	4	5	6	7	8	9
	1	1	1	1	1	1	1	1	1
2.		2	3	4	5	6	7	8	9
		2	2	2	2	2	2	2	2
3.			3	4	5	6	7	8	9
			3	3	3	3	3	3	3
4.				4	5	6	7	8	9
				4	4	4	4	4	4
5.					5	6	7	8	9
					5	5	5	5	5
6.						6	7	8	9
						6	6	6	6
7.							7	8	9
							7	7	7
8.								8	9
								8	8
9.									9
									9

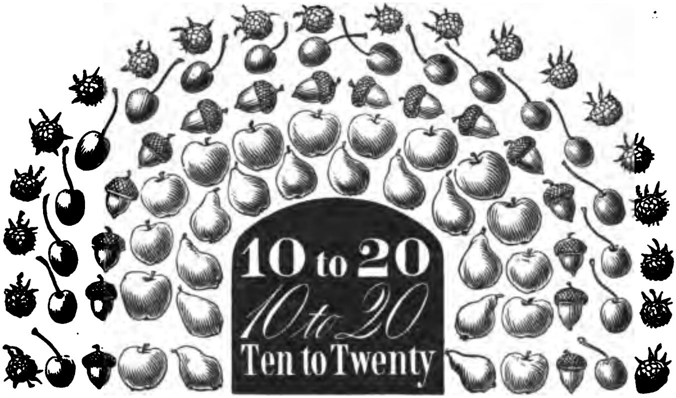
Page 63.—All the primary combinations from 10 to 20, inclusive, are brought out in the exercises, pages 63 to 78, but not in numerical order.

III. b.—Use these exercises for either mental or written work, or for both—as seems most desirable. The same suggestion applies to the exercises following each table from 10 to 20.

IV. a. Ex. 12.—In this and similar questions prepare the pupil, by oral exercises, to perceive that 4 3's equal 3 4's, etc.

Page 65.—Teach pupils to name only results in adding. Thus: in adding 4, 5, 7, and 2, instead of their saying "4 and 5 are 9, and 7 are 16, and 2 are 18," require them to begin with the sum of the first two numbers, and name only the results—9, 16, 18.

Page 77.—On completing the mental exercises on this page, the pupil has formed all the primary combinations in addition and subtraction; *i. e.*, all the combinations that can be made with any two of the first nine numbers.



I. 1. Ten pears and one pear are how many pears?

2. Eleven pears and one pear are how many pears?

3. Twelve apples and one apple are how many apples?

4. Thirteen apples and one apple are how many apples?

5. Fourteen acorns and one acorn are how many acorns?

6. Fifteen acorns and one acorn are how many acorns?

7. How many cherries are sixteen cherries and one cherry? Seventeen cherries and one cherry?

8. How many berries are eighteen berries and one berry? Nineteen berries and one berry?

II. To express numbers greater than 9 by figures, two or more of the ten figures must be combined.

Words.	Eleven		Twelve		Thirteen		Fourteen		Fifteen	
Figures and letters.	11	XI	12	XII	13	XIII	14	XIV	15	XV
Words.	Sixteen		Seventeen		Eighteen		Nineteen		Twenty	
Figures and letters.	16	XVI	17	XVII	18	XVIII	19	XIX	20	XX

1. Show me 10 crayons; 14 crayons; 18 crayons.
2. Show me 13 panes of glass; 17 panes; 11 panes.
3. Show me 15 pens; 19 pens; 12 pens; 16 pens; 20 pens.

III. How many are

1. 12 apples and 1 apple?
2. 15 acorns and 1 acorn?
3. 18 berries and 1 berry?
4. 11 pears and 1 pear?
5. 14 acorns and 1 acorn?
6. 17 cherries and 1 cherry?
7. 10 pears and 1 pear?
8. 13 apples and 1 apple?
9. 16 cherries and 1 cherry?
10. 19 berries and 1 berry?

IV. 1. Compare 10 and 11.

10 is 1 less than 11; 11 is 1 more than 10.

2. Compare 15 and 16. Compare 11 and 12. 14 and 15.
3. Compare 17 and 18. Compare 12 and 13. 18 and 19.
4. Compare 13 and 14. Compare 16 and 17. 19 and 20.

V. Copy these numbers five times on your slate:

Eleven	11	Seventeen	17	Fourteen	14	Twelve	12
Fifteen	15	Thirteen	13	Nineteen	19	Eighteen	18
		Sixteen	16	Twenty	20		

VI. 1. What figures are used to express ten? To express seventeen? To express fourteen? Eleven? Eighteen?

2. What figures are used to express fifteen? To express twelve? To express sixteen? Nineteen? Thirteen?

3. In expressing each of these ten numbers, what is the left-hand figure?

4. What figures are used to express twenty? Where is the 0 placed?

VII. Write in figures

Seventeen	Fifteen	Twelve	Fourteen	Eleven
Thirteen	Eleven	Eighteen	Seventeen	Twenty
Nineteen	Sixteen	Twenty	Nineteen	Seventeen

Write in words				Express by letters				
12	20	19	13	Eleven	Thirteen	Fifteen	18	13
15	17	20	17	Sixteen	Eighteen	Twenty	15	16
19	11	18	12	Twelve	Fourteen	Seventeen	11	19
16	*15*	*14*	*16*	Seventeen	Nineteen	Eighteen	17	15

11 12

I. How many pens are
1. 10 pens and 1 pen?
2. 11 times 1 pen?
3. 11 pens less 2 pens?

How many pens are
4. 3 pens and 8 pens?
5. 11 pens less 7 pens?
6. 5 pens and 6 pens?
7. How many times can we take 11 pens from 11 pens?
8. How many times is 1 pen contained in 11 pens?
9. 1 eleventh of 11 sheets of paper is how many sheets?
10. 1 sheet of paper is what part of 11 sheets?

II. 1. Compare 11 with each number less than 11.

11 is 1 more than 10; 10 is 1 less than 11.
11 is 2 more than 9; 9 is 2 less than 11; and so on.

2. 11 is how many 1's? How many 3's? 5's? 7's? 9's?
3. 11 is how many times 2? 4? 6? 9? 10?

III. a. Copy and complete this table:

11

10+1=	1+10=	11−1=	11−10=
9+2=	2+ 9=	11−2=	11− 9=
8+3=	3+ 8=	11−3=	11− 8=
7+4=	4+ 7=	11−4=	11− 7=
6+5=	5+ 6=	11−5=	11− 6=

b. Find the number omitted in each of these exercises:

11=1+
11=3+
11=2+

4=11−
6=11−
5=11−

+10=11
+ 9=11
×11=11

8+ =11
7+ =11
11÷ = 1

IV. a. 1. How many are 11 rooms and 1 room?
2. 12 times 1 room?
3. 3 steps and 9 steps?
4. 7 steps and 5 steps?
5. 12 doors less 2 doors?
6. 12 doors less 8 doors?
7. 6 floors and 6 floors?
8. 2 times 6 floors?
9. 6 times 2 floors?
10. 4 hooks, and 4 hooks, and 4 hooks?
11. 3 times 4 hooks?
12. 4 times 3 hooks?

13. How many times can we take 1 knob from 12 knobs? 2 knobs from 12 knobs? 3 knobs from 12 knobs? 4 knobs from 12 knobs? 6 knobs from 12 knobs?

b. 12 bars are how many times	How many spikes are	What part of 12 logs
1. 2 bars?	6. 1 half of 12 spikes?	11. Are 6 logs?
2. 3 bars?	7. 1 third of 12 spikes?	12. Are 4 logs?
3. 4 bars?	8. 1 fourth of 12 spikes?	13. Are 3 logs?
4. 6 bars?	9. 1 sixth of 12 spikes?	14. Are 2 logs?
5. 12 bars?	10. 1 twelfth of 12 spikes?	15. Is 1 log?

V. 1. Compare 12 with each number less than 12.

2. 12 is how many 2's? How many 3's? 4's? 6's?

3. 12 is how many times 5? 7? 8? 9? 10?

VI. a. Copy and complete this table:

12

10+2=	2+10=	12−2=	12−10=
9+3=	3+ 9=	12−3=	12− 9=
8+4=	4+ 8=	12−4=	12− 8=
7+5=	5+ 7=	12−5=	12− 7=
6+6=		12−6=	
6×2=	2× 6=	12÷2=	12÷ 6=
4×3=	3× 4=	12÷3=	12÷ 4=
1 *half of* 12=		1 *fourth of* 12=	
1 *third of* 12=		1 *sixth of* 12=	

b. Find the number omitted in each of these exercises:

1+ =12	12÷6=	×6=12	8+4=
12− = 2	9+3=	÷3= 4	12÷ =4
3× =12	12−5=	+6=12	÷6=2

VII. Combinations of the numbers 11, 12.

1. 11 is 3 more than 2 times what number?
2. 3 times 3 are how many less than 11?
3. How many times is 3 contained in 1 half of 12?
4. 1 half of 10 from 11 leaves 1 half of what number?

5. Subtract 3 from 11, divide by 4, add 3, multiply by 2, subtract 4 times 2, multiply by 3, and add 5.

6. From 12 take 3, divide by 1 third of 9, multiply by 1 half of 8, divide by 1 third of 6, and add 4.

7. $5+6, -3, \div 2, +7, -1, \div 5, +1, \times 3 =$ what number?

8. $2 \times 3 \times 2 \div 4, +8, -1, +2, \div 6, +2$ are how many?

9. $10 \div 2, -1, \times 2, +3, -5, \div 3, \times 5, +1, -6 =$ how many?

VIII. Applications of the numbers 11, 12.

1. Robert had 11 rabbits, but he sold 6 of them. How many rabbits did he keep?

2. How many pupils can sit at 6 double desks?

3. Maria has 7 birds, and Eva has 4. How many birds have the two girls?

4. 4 ships have 12 masts. How many masts has 1 ship?

5. How many feet have 2 cats and a kitten?

6. How many feet have 3 dogs?

7. In a stable were 11 horses, but 8 of them have been taken out. How many horses are in the stable?

8. Seven shade trees are on one side of a street, and five on the other side. How many shade trees are on the street?

9. John found 4 eggs in one nest, 3 eggs in another, and 5 eggs in another. How many eggs did he find?

10. If I have 11 cents, how many pears can I buy at 2 cents apiece, and how many cents will I have left?

11. How many at 4 cents apiece? At 5 cents apiece?

WRITE AND ADD

1	2	3	4	5	6
2	2	1	2	2	2
2	1	3	0	1	0
2	3	3	3	3	4
2	4	3	4	5	0
3	1	2	3	0	6

SUBTRACT

1	2	3
11	11	11
3	6	4
4	**5**	**6**
12	12	12
5	9	7

DIVIDE

1	2
3)12	2)12
3	**4**
4)12	6)12
5	**6**
3)11	5)11

13 11

I. How many birds are
1. 12 birds and 1 bird?
2. 13 times 1 bird?
3. 11 birds and 2 birds?
4. 13 birds less 3 birds?

How many birds are
5. 5 birds and 8 birds?
6. 13 birds less 4 birds?
7. 6 birds and 7 birds?
8. 13 birds less 13 birds?

9. How many times can I take 1 quilt from 13 quilts?
10. How many times is 1 quilt contained in 13 quilts?
11. 1 thirteenth of 13 pigeons is how many pigeons?
12. 1 pigeon is what part of 13 pigeons?

II. 1. Compare 13 with each number less than 13.

2. 13 is how many times 1? How many times 3? 5? 7? 9? 11?

3. 13 is how many 2's? How many 4's? 6's? 8's? 10's? 12's?

III. a. Copy and complete this table:

13			
10+3=	3+10=	13−10=	13−3=
9+4=	4+ 9=	13− 9=	13−4=
8+5=	5+ 8=	13− 8=	13−5=
7+6=	6+ 7=	13− 6=	13−7=

b. Find the numbers omitted in each of these exercises:

7+ 6=	13− =12	+ 2=13	5+ 8=
13− 3=	6+ =13	− 4= 9	13− = 9
2+11=	13− = 8	+ 1=13	+10=13
13× 1=	13÷ =13	×13=13	13÷13=

IV. a. How many hours are
1. 13 hours and 1 hour?
2. 14 times 1 hour?
3. 14 hours less 2 hours?
4. 11 hours and 3 hours?
5. 9 hours and 5 hours?
6. 14 hours less 10 hours?
7. 14 hours less 8 hours?
8. 7 hours and 7 hours?
9. 2 times 7 hours?
10. 7 times 2 hours?

11. How many times can 1 week be taken from 14 weeks? 2 weeks from 14 weeks? 7 weeks from 14 weeks?

b. 14 months are how many times	How many days are	What part of 14 years
1. 2 months ?	4. 1 half of 14 days ?	7. Are 7 years ?
2. 7 months ?	5. 1 seventh of 14 days ?	8. Are 2 years ?
3. 14 months ?	6. 1 fourteenth of 14 days ?	9. Is 1 year ?

V. 1. Compare 14 with each number less than 14.

2. 14 is how many 2's ? How many 7's ?

3. 14 is how many times 3 ? 4 ? 5 ? 6 ? 8 ? 9 ? 10 ?

VI. a. Copy and complete this table :

14

10+4= 4+10= | 14−4= 14−10=
9+5= 5+ 9= | 14−5= 14− 9=
8+6= 6+ 8= | 14−6= 14− 8=
7+7= | 14−7=
7×2= 2× 7= | 14÷2= 14÷ 7=
1 *half of* 14= | 1 *seventh of* 14=

b. Find the number omitted in each of these exercises :

6=14− 4+ =14 14−13= 7+ =14
14= 2+ 7× =14 2× 7= 14÷ = 1
7=14− 14− = 9 14−11= ÷ 7= 2

VII. Combinations of the numbers 13, 14.

1. 13 is how many more than 3 times 3 ?
2. 14 minus 3 times 3 is how many less than 2 times 6 ?
3. How many times is 8 contained in 13 less 1 half of 6 ?
4. 3 times 4 from 2 times 7 leaves what number ?
5. Divide 12 by 4, multiply by 3, add 4, subtract 1 third of 9, divide by 5, add 1 half of 12, and divide by 7 minus 2.
6. Add 6, 5, and 3 ; subtract 2 and 9 ; multiply by 4, and divide by 2. How many less than 14 have you ?
7. 6×2, +1, −3, ÷2, −1, ×3, +1 fifth of 5, ÷ 3 = what number ?
8. 12−4+6, ÷2, +5, ÷6, +3 times 3 and how many=13 ?
9. 8+5−6, ×2, −5, ÷ 3, +3, ×2, ÷ 4, −1, ×7, −3=what number ?

VIII. Applications of the numbers 13, 14.

1. Clara had 14 cents, but she paid out 9 cents for candy. How many cents had she left?

2. In a pasture are 9 oak trees, and 4 pine trees. How many trees are in the pasture?

3. Seven cows are in one field, and seven in another. How many cows are in the two fields?

4. Lewis bought 13 figs, and gave 6 of them to his sister. How many figs had he left?

5. Seven pairs of horses are how many horses?

6. Fanny has 3 peaches, Olive has 6, and Addie has 4. How many peaches have the three girls?

7. Among how many playmates can you divide 13 chestnuts, and how many chestnuts will you have left if you give them 2 chestnuts apiece? 3 chestnuts apiece? 4 apiece? 5 apiece? 6 apiece?

WRITE AND ADD

1	2	3	4	5	6
3	5	4	3	5	1
5	1	4	3	4	3
0	3	4	3	3	2
4	1	1	2	2	7

7	8	9	10	11	12
3	5	3	2	2	5
2	0	1	0	0	2
0	4	3	7	4	4
3	4	2	2	0	0
3	1	3	2	5	3

WRITE AND DIVIDE

1	2	3	4	5
2)14	7)14	6)14	3)13	5)13

WRITE AND SUBTRACT

1	2	3	4
13	13	13	13
4	7	5	9

5	6	7	8
14	14	14	14
8	6	7	5

WRITE AND MULTIPLY

1	2	3	4
4	2	6	12
3	7	2	1

5	6	7	8
2	7	1	3
6	2	14	4

I. a. How many pins are
1. 14 pins and 1 pin?
2. 15 times 1 pin?
3. 4 pins and 11 pins?
4. 15 pins less 6 pins?
5. 12 pins and 3 pins?
6. 15 pins less 5 pins?

How many pins are
7. 8 pins and 7 pins?
8. 15 pins less 13 pins?
9. 5 pins, and 5 pins, and 5 pins?
10. 3 times 5 pins?
11. 5 times 3 pins?

12. How many times can I take 1 skein of thread from 15 skeins? 3 skeins from 15 skeins? 5 skeins from 15 skeins?

b. 15 needles are
1. How many times 3 needles?
2. How many times 5 needles?
3. How many times 15 needles?

How many spools
4. Are 1 third of 15 spools?
5. Are 1 fifth of 15 spools?
6. Are 1 fifteenth of 15 spools?

What part of 15 thimbles
7. Are 5 thimbles?
8. Are 3 thimbles?
9. Is 1 thimble?

II. 1. Compare 15 with each number less than 15.
2. 15 is how many 3's? How many 5's?
3. 15 is how many times 2? 4? 6? 7? 8? 9? 10? 11? 12? 13? 14?

III. a. Copy and complete this table:

15

10+5= 5+10=
9+6= 6+ 9=
8+7= 7+ 8=
5×3= 3× 5=
1 *third of* 15=

15−5= 15−10=
15−6= 15− 9=
15−7= 15− 8=
15÷5= 15÷ 3=
1 *fifth of* 15=

b. Find the number omitted in each of these exercises:

3×5=
15−4=
9+6=

15÷ = 1
12+ =15
15× =15

+1=15
÷3= 5
−5=10

13+ 2=
15÷ = 3
+ 8=15

IV. **a.** 1. How many are 15 boats and 1 boat?

2. 16 boats less 5 boats?
3. 9 boats and 7 boats?
4. 16 boats less 3 boats?
5. 12 boats and 4 boats?
6. 16 boats less 6 boats?
7. 14 cars and 2 cars?
8. 8 cars and 8 cars?
9. 2 times 8 cars?
10. 8 times 2 cars?
11. 4 cars, and 4 cars, and 4 cars, and 4 cars?
12. 4 times 4 cars?

13. How many times can we take 1 oar from 16 oars? 2 oars from 16 oars? 4 oars from 16 oars? 8 oars from 16 oars?

b. 16 sleighs are how many times
1. 2 sleighs?
2. 4 sleighs?
3. 8 sleighs?

How many carts are
4. 1 half of 16 carts?
5. 1 fourth of 16 carts?
6. 1 eighth of 16 carts?
7. 1 sixteenth of 16 carts?

What part of 16 coaches
8. Are 8 coaches?
9. Are 4 coaches?
10. Are 2 coaches?
11. Is 1 coach?

V. 1. Compare 16 with each number less than 16.

2. 16 is how many 2's? How many 4's? 8's?

3. Divide 16 by 3. By 5. By 7. By 9.

16

VI. **a.** Copy and complete this table:

10+6= 6+10=
9+7= 7+ 9=
8+8=
8×2= 2× 8=
4×4=
16−6= 16−10=
16−7= 16− 9=
16−8=
16÷2= 16÷ 8=
16÷4=
1 *half of* 16= 1 *fourth of* 16= 1 *eighth of* 16=

b. Find the number omitted in each of these exercises:

16÷8=
11+5=
16−7=
4×4=

1+ =16
16× =16
16− = 8
16÷ = 1

− 4=12
+10=16
− 2= 8
−14= 2

13=16−
4=16÷
16= 8×
16=11+

VII. Combinations of the numbers 15, 16.

1. 3 and 8 and how many equal 3 times 5?
2. How many are 2 times 2 times 2 times 2?
3. 15 less 2 times 6 is 1 fifth of what number?
4. From 16 less 3 take 14 less 9.
5. Divide 14 by 7, multiply by 6, subtract 3, add 6, divide by 5, multiply by 3, add 5, divide by 2, and add 8.
6. From 16 subtract 9, multiply by 2, add 1, divide by 5, multiply by 4, add 4, and subtract 1 half of 10.
7. $15-4-5, \times 2, \div 3+3, \times 2-9, \times 3$ are how many?
8. $5+7+4\div 8+1, \times 3+6, \div 3, \times 2+4-6=$ how many?

VIII. Applications of the numbers 15, 16.

1. One hen has 9 chickens, and another has 7. How many chickens have the two hens?
2. How many cents are 3 half-dimes?
3. A cooper made 15 wash-tubs, and sold 8. How many had he left?
4. A man paid 8 dollars for flour, and 7 dollars for coal. How many dollars did he pay out?
5. Sixteen oxen are how many pairs of oxen?
6. A woman having 15 ducks, sold all but 6 of them. How many ducks did she sell?
7. How many fingers have 2 boys? Have 4 gloves?
8. A dealer sold picture frames, at 3 dollars apiece, and received 15 dollars. How many frames did he sell?
9. Eliza had 16 cents, and she spent 11 cents for paper. How many cents had she then?
10. 3 feet are 1 yard; 16 feet are how many yards?

	1	2	3	4
From	16	16	12	16
Take	9	7	6	8

	1	2	3	4
Multiply	4	3	2	5
By	4	5	8	3

	1	2	3	4	5	6	7
Divide	3)15	2)16	7)15	4)16	8)16	5)15	7)16

17 18

I. How many cents are

1. 16 cts. and 1 ct.?
2. 17 times 1 cent?
3. 17 cents less 5 cents?
4. 14 cents and 3 cents?
5. 17 cents less 7 cents?
6. 4 cents and 13 cents?
7. 17 cents less 15 cents?
8. 9 cents and 8 cents?
9. 17 cents less 6 cents?

10. How many times can I take 1 dime from 17 dimes?

11. Then, how many times is 1 dime contained in 17 dimes?

12. 1 seventeenth of 17 dollars is how many dollars?

13. 1 dollar is what part of 17 dollars?

II. 1. Compare 17 with each number less than 17.

2. 17 is how many times 8? 7? 6? 5? 4? 3? 2?

3. 17 is how many times 16? 15? 14? 13? 12? 11? 10? 9?

III. a. Copy and complete this table:

17

10+7= 7+10= | 17−10= 17−8=
9+8= 8+ 9= | 17− 7= 17−9=

b. Find the number omitted in each of these exercises:

13+4= 15+ =17 ÷17= 1 14=17−
17+7= 17− =12 + 6=17 17=19−

IV. a. How many are

1. 17 tubs and 1 tub?
2. 18 times 1 tub?
3. 18 tubs less 5 tubs?
4. 15 tubs less 3 tubs?
5. 18 tubs less 11 tubs?
6. 12 tubs and 6 tubs?
7. 18 tubs less 10 tubs?
8. 16 tubs and 2 tubs?
9. 18 tubs less 4 tubs?
10. 9 casks and 9 casks?
11. 2 times 9 casks?
12. 9 times 2 casks?
13. 6 kegs, and 6 kegs, and 6 kegs?
14. 3 times 6 kegs?
15. 6 times 3 kegs?

16. How many times can I take 2 pans from 18 pans? 6 pans from 18 pans? 9 pans from 18 pans?

b. 18 basins are how many times
1. 2 basins?
2. 3 basins?
3. 6 basins?
4. 9 basins?

How many fruit cans are
5. 1 half of 18 fruit cans?
6. 1 third of 18 fruit cans?
7. 1 sixth of 18 fruit cans?
8. 1 ninth of 18 fruit cans?
9. 1 eighteenth of 18 fruit cans?

What part of 18 bottles
10. Are 9 bottles?
11. Are 6 bottles?
12. Are 3 bottles?
13. Are 2 bottles?
14. Is 1 bottle?

V. 1. Compare 18 with each number less than 18.
2. 18 is how many 2's? How many 3's? 6's? 9's?
3. Divide 18 by each number from 1 to 10.

VI. a. Copy and complete this table:

18

10+8= 8+10= | 18−8= 18−10=
9+9= | 18−9=
9×2= 2× 9= | 18÷2= 18÷ 9=
6×3= 3× 6= | 18÷3= 18÷ 6=
1 *half of* 18= | 1 *sixth of* 18=
1 *third of* 18= | 1 *ninth of* 18=

b. Find the number omitted in each of these exercises:

13+5=
9×2=
18−7=
18÷6=

3× =18
18− = 4
18÷ = 9
8+ =18

÷ 3= 6
+12=18
×18=18
− 3=15

9=18−
18= 2+
2=18÷
18=18×

VII. Combinations of the numbers 17, 18.

1. 10 plus 7 are how many more than 9 plus 8?
2. From 18 take 4 4 times; how many times 2 remain?
3. 17 less 5 are how many 3's?
4. 3 times 5 minus 6 is what part of 18?
5. Multiply 8 by 2, subtract 4, add 12 less 7, and subtract 9 plus 4.
6. To 11 add 6, subtract 5, divide by 4, multiply by 10 less 7, add 3 times 3, subtract 11 less 5, and divide by 8 less 2.
7. 14÷2, +5, −8, +11, ÷5, +14, −2, ÷7 = how many?
8. 17−5+6, ÷1 third of 9, +10, −7, −2 = what number?

VIII. Applications of the numbers 17, 18.

1. On one hill of corn are 8 ears, and on another are 9. How many ears are on both hills?

2. How many times will 18 oranges fill a fruit dish which holds 9 oranges?

3. Three sets of six chairs each are how many chairs?

4. A fruit dealer had 17 lemons, and sold 9 of them. How many lemons had he left?

5. Harvey paid 10 cents for a copy-book, and 8 cents for a slate. How many cents did he pay out?

6. Eighteen shoes are how many pairs of shoes?

7. If I have 9 filberts in each hand, how many filberts have I in both hands?

8. One day a tinsmith made 3 times 2 times 3 basins. How many basins did he make?

9. If a man walks 3 miles in an hour, how many hours will he be in walking 18 miles?

WRITE AND ADD

1	2	3	4	5
3	4	2	5	2
6	0	5	1	1
3	8	2	5	4
3	4	5	1	8
1	2	2	5	3

6	7	8	9	10
7	6	4	3	5
4	4	6	4	8
6	5	8	7	3

11	12	13	14	15
1	6	8	4	3
3	5	1	1	8
4	7	0	3	1
9	0	6	10	4

16	17	18	19	20
6	1	5	5	2
2	6	4	2	7
3	0	1	7	5
4	11	6	4	3

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9	10
18	14	17	15	18	17	16	18	17	18
6	*11*	*9*	2	8	10	5	7	13	9

19 20

I. How many flies are
1. 18 flies and 1 fly?
2. 19 times 1 fly?
3. 11 flies and 8 flies?
4. 19 flies less 5 flies?
5. 19 flies less 9 flies?

How many flies are
6. 2 flies and 17 flies?
7. 19 flies less 7 flies?
8. 15 flies and 4 flies?
9. 19 flies less 13 flies?
10. 3 flies and 16 flies?

11. How many times can I take 1 trout from 19 trout?
12. Then, 19 trout are how many times 1 trout?
13. 1 nineteenth of 19 fish-hooks is how many fish-hooks?
14. 1 fish-hook is what part of 19 fish-hooks?

Any number whose right-hand figure is 2, 4, 6, 8, or 0 is an **even number**; and

Any number whose right-hand figure is 1, 3, 5, 7, or 9 is an **odd number.**

II. 1. Compare 19 with each number less than 19.
2. Divide 19 by each odd number between 1 and 19.
3. Divide 19 by each even number less than 19.

III. Find the number omitted in each of these exercises:

5+ =19
1× =19
19− =19

÷19= 1
−13= 6
+17=19

19= 7+
16=19−
19=19÷

15+4=
19−1=
10+9=

IV. a. How many are
1. 19 bolts and 1 bolt?
2. 20 bolts less 6 bolts?
3. 8 bolts and 12 bolts?
4. 20 bolts less 3 bolts?
5. 13 bolts and 7 bolts?
6. 20 bolts less 18 bolts?
7. 5 bolts and 15 bolts?
8. 20 bolts less 9 bolts?

9. 16 bolts and 4 bolts?
10. 10 files and 10 files?
11. 2 times 10 files?
12. 10 times 2 files?
13. 5 rings, and 5 rings, and 5 rings, and 5 rings?
14. 4 times 5 rings?
15. 5 times 4 rings?

16. From 20 rivets how many times can I take 1 rivet? *2 rivets? 4 rivets?* 5 rivets? 10 rivets?

b. 20 chains are how many times
1. 2 chains?
2. 4 chains?
3. 5 chains?
4. 10 chains?

How many spades are
5. 1 half of 20 spades?
6. 1 fourth of 20 spades?
7. 1 fifth of 20 spades?
8. 1 tenth of 20 spades?
9. 1 twentieth of 20 spades?

What part of 20 rings
10. Are 10 rings?
11. Are 5 rings?
12. Are 4 rings?
13. Are 2 rings?
14. Is 1 ring?

V. 1. Compare 20 with each number less than 20.
2. Divide 20 by all even numbers less than 11.
3. Divide 20 by all odd numbers between 1 and 10.

19, 20

VI. a. Copy and complete this table:

10+9= 9+10=
10+10=
10×2= 2×10=
5×4= 4× 5=
1 *half of* 20=
1 *fourth of* 20=

19−9= 19−10=
20−10=
20÷2= 20÷10=
20÷4= 20÷ 5=
1 *fifth of* 20=
1 *tenth of* 20=

b. Find the number omitted in each of these exercises:

×10=20
+13=20
−12= 8
÷ 4= 5

20= 3+
6=20−
20=12+
20= 1×

10=20−
20= 4+
2=20÷
20= 4×

2×10=
20÷ 5=
20− 9=
4× 5=

VII. Combinations of the numbers 19, 20.

1. How many are two 2's and three 5's?
2. What number is 9 less than 4 times 5?
3. 10 plus 9 are how many more than 8 plus 7?
4. 20 is how many more than 3 times 3 times 2?
5. From 19 subtract 4, divide by 5, multiply by 6, subtract 2 times 7, multiply by 3, subtract 5, and multiply by 2.
6. Add 10 and 2, subtract 5, multiply by 2, subtract 9, multiply by 4, divide by 2, add 7, subtract 2 times 3, subtract 3, and add 2 times 6.

7. 19−7,÷2,×3,+1,−5,÷7,×8 and how many=19?
8. 2+3+4+5+6= how many times 1 third of 15?

VIII. Applications of the numbers 19, 20.

1. A grocer having 19 boxes of soap, sold 9 of them. How many boxes of soap had he then?

2. A butcher paid 20 dollars for fat sheep at 5 dollars a head. How many sheep did he buy?

3. A gallon is 4 quarts. 5 gallons are how many quarts?

4. How many times must a man carry 2 pails full, to fill a tub that will hold 20 pailfuls?

5. If I put 20 spoonfuls of cream into glasses that hold 10 spoonfuls each, how many glasses will I fill?

6. A teacher bought 5 readers, 6 spellers, and 8 primers. How many books did she buy?

7. If I can buy 2 steel-pens for a cent, how many steel-pens can I buy for 10 cents?

8. Nineteen cents are how many half-dimes?

WRITE AND ADD

1	2	3	4	5
3	4	6	3	4
6	6	6	9	5
7	3	6	4	8
4	6	2	1	3

6	7	8	9	10
3	4	3	0	1
1	0	1	4	1
3	7	1	2	9
6	0	2	0	3
0	2	9	8	2
3	0	3	3	1
2	3	1	0	2

WRITE AND SUBTRACT

1	2	3	4	5
18	19	20	19	20
10	9	10	10	8

WRITE AND MULTIPLY

1	2	3	4	5
8	3	2	4	9
2	6	10	5	2

WRITE AND DIVIDE

1	2	3	4
2)18	5)20	6)18	10)20

5	6	7	8
2)20	3)18	4)20	9)18

SUGGESTIONS TO TEACHERS

Page 81. VI.—Require pupils to write the numbers in columns neatly, and to bring their work to the class for inspection.

Page 83. IV.—In all the adding and subtracting exercises following the tables, the highest number must not exceed 100. Drill the class daily in these exercises till they can combine numbers correctly and rapidly.

Page 97.—These drills in rapid combinations are of two kinds—combinations in series, and promiscuous combinations.

For Combinations in Series.—Write any number not greater than 10 any convenient number of times in a circle—as shown on page 97—and conduct the drills by some one of the following methods:

1. With a pointer, begin at any place in the circle, the class, in concert, adding or subtracting and giving results as you point to the numbers, in succession, round the circle.

2. Require a pupil to point to the numbers, and the class to add or subtract in concert.

3. Require a pupil to point to the numbers, and add or subtract orally, and the class to detect his mistakes.

4. Require a pupil to point to the numbers, and the other pupils of the class, each in turn, to name a result.

For Promiscuous Combinations.—Write **a**, **b**, **c**, **d** at the corners of a square, and on each of the sides write a different number, say five times (see page 97); or, on each side of the square write, say, five different numbers.

Conduct the drills by the methods above given for combinations in series, observing that the adding or subtracting may commence at any one of the corners—**a**, **b**, **c**, **d**—and proceed in either direction round the square.

Page 98. D.—For additional drill, give exercises like the following:

Subtraction.—1. Name all the numbers that can be taken from 9, and the numbers that will remain.

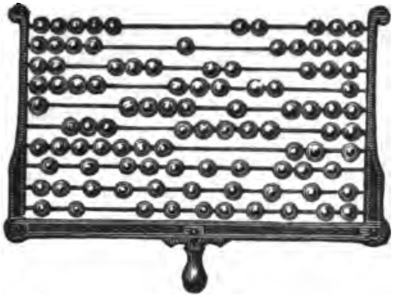
2. What numbers can be taken from 10, and what numbers will remain? And so on, to 20.

Multiplication.—1. Name each two numbers whose product is 12. Thus: 6 times 2, or 2 times 6 are 12. 4 times 3, or 3 times 4 are 12.

2. Name each two numbers whose product is 14, 15, 18, 20, and so on, to 100. Use only composite numbers, and require only factors that do not exceed 10.

Division.—1. Name all the numbers, to 20 inclusive, that contain 2. Thus: 2 is contained in 2, 4, 6, 8, 10, 12, 14, 16, 18, and 20.

2. Name all the numbers to 30, inclusive, that contain 3. And so on to *100, inclusive, divided* by 10.



10 tens are 1 hundred.

TENS AND HUNDREDS

I. 1. How many wires are in this Numeral Frame?

2. How many balls are on each wire?

3. Are on 2 wires?

4. Are 10 balls and 10 balls?

5. Are 2 times 10 balls?

6. Are on 3 wires?

7. Are 20 balls and 10 balls?

8. Are 10 balls, and 10 balls, and 10 balls?

9. Are 3 times 10 balls?

II. a. How many balls are

1. On four wires?

2. Thirty balls and ten balls?

3. Ten balls, and ten balls, and ten balls, and ten balls?

4. Four times ten balls?

5. On five wires?

6. Forty balls and ten balls?

7. Five times ten balls?

8. On six wires?

9. Fifty balls and ten balls?

10. Six times ten balls?

11. Sixty balls and ten balls?

12. Seven times ten balls?

13. Seventy balls and ten balls?

14. Eight times ten balls?

15. Eighty balls and ten balls?

16. Nine times ten balls?

17. Ninety balls and ten balls?

18. Ten times ten balls?

b. Count all the balls from

1. One ball to ten balls.
2. Ten balls to twenty balls.
3. Twenty balls to thirty balls.
4. Thirty balls to forty balls.
5. Forty balls to fifty balls.
6. Fifty to sixty balls.
7. Sixty to seventy balls.
8. Seventy to eighty balls.
9. Eighty to ninety balls.
10. Ninety to one hundred balls.

III. a. Ten *ones* taken together are *one ten.*

2 tens are twenty	20	XX	6 tens are sixty	60	LX
3 tens are thirty	30	XXX	7 tens are seventy	70	LXX
4 tens are forty	40	XL	8 tens are eighty	80	LXXX
5 tens are fifty	50	L	9 tens are ninety	90	XC

b. Copy and read these nine numbers:

21	22	23	24	25	26	27	28	29
XXI	XXII	XXIII	XXIV	XXV	XXVI	XXVII	XXVIII	XXIX

c. Complete and read the numbers from thirty to one hundred:

30, 31, 32, 33, - - - - - 39
40, 41, 42, - - - - - - - 49
50, 51, - - - - - - - - 59
60, - - - - - - - - - 69
70, - - - - - - - - - -
80, - - - - - - - - - -
90, - - - - - - - - - 99

XXX, - - - - - - - - - XXXIX
XL, XLI, - - - - - - - - XLIX
L, - - - - - - - - - LIX
LX, - - - - - - - - - LXIX
LXX, - - - - - - - - - -
LXXX, - - - - - - - - - -
XC, - - - - - - - - - XCIX

IV. Write in figures		Write in letters		Write in words	
Twenty-one	lxxviii	Forty	94	lxv	89
Thirty	lvii	Twenty-two	79	xli	95
Forty-eight	xlii	Thirty-one	58	xxiii	80
Sixty-six	xxiv	Forty-nine	43	xxxii	59
Eighty-four	xxxiii	Sixty-seven	25	l	44
Ninety-six	li	Eighty-five	34	lxviii	26
Seventy-five	lxix	Ninety-seven	52	lxxxvi	85
Fifty-three	lxxxvii	Seventy-six	70	xcviii	58

d. Read each of these numbers:

38	92	29	81	60	lxii	xx	lxxxii	xxviii
56	83	36	99	45	liv	lv	lxi	xxxvii
74	47	90	72	27	xci	lxxiii	xlvi	xix

V. **a.** Ten *tens* taken together are *one hundred.*

The hundreds are expressed by figures, thus:

One hundred	100	Four hundred	400	Seven hundred	700
Two hundred	200	Five hundred	500	Eight hundred	800
Three hundred	300	Six hundred	600	Nine hundred	900

b. Read each of these numbers:

700	960	210	591	716	434	309	702	104	268
520	340	470	444	343	254	207	506	819	999

VI. Exercises to be written on the slate, and read in class:

Write in figures		Write in words	
Two hundred	Three hundred seventy	300	216
Eight hundred	Seven hundred sixty	408	343
One hundred eight	Five hundred sixteen	117	700
Five hundred two	Four hundred fifty-one	871	865
Seven hundred three	Two hundred seventy-four	500	912
Six hundred nine	Nine hundred ninety-nine	609	594

20 to 30

I. **a.** 1. Add from 0 to 21, by 3's. By 7's.

2. Subtract from 21 to 0, by 3's. By 7's.

How many ships are

3. 7 times 3 ships?
4. 3 times 7 ships?

21 masts are

5. How many times 3 masts?
6. How many times 7 masts?

b. Add from 0

1. To 24, by 3's. By 8's.
2. To 24, by 4's. By 6's.

Subtract to 0

3. From 24, by 3's. By 8's.
4. From 24, by 4's. By 6's.

How many sleds are

5. 8 times 3 sleds?
6. *3 times 8 sleds?*

How many skates are

7. 6 times 4 skates?
8. 4 times 6 skates?

24 sleds are

9. How many times 3 sleds?
10. How many times 8 sleds?

24 skates are

11. How many times 4 skates?
12. How many times 6 skates?

c. 1. Add from 0 to 25, and subtract from 25 to 0, by 5's.
2. How many rocks are 5 times 5 rocks?
3. 25 pebbles are how many times 5 pebbles?

d. 1. Add from 0 to 27, by 3's. By 9's.
2. Subtract from 27 to 0, by 3's. By 9's.
3. How many are 9 times 3 stoves? 3 times 9 stoves?
4. 27 stoves are how many times 3 stoves? How many times 9 stoves?

e. 1. Add from 0 to 28, by 4's. By 7's.
2. Subtract from 28 to 0, by 4's. By 7's.
3. How many are 7 times 4 ponies? 4 times 7 ponies?
4. 28 colts are how many times 4 colts? How many times 7 colts?

II. **III. a.** Copy and complete these Tables:

a. How many are	**b.** How many times can you take	MULTIPLICATION.		DIVISION.	EQUAL PARTS.
1. 7 3's?	3 from 21?	21	7 × 3=	21 ÷ 3=	1 third of 21=
2. 3 7's?	7 from 21?		3 × 7=	21 ÷ 7=	1 seventh of 21=
3. 8 3's?	3 from 24?	24	8 × 3=	24 ÷ 3=	1 third of 24=
4. 3 8's?	8 from 24?		3 × 8=	24 ÷ 8=	1 eighth of 24=
5. 6 4's?	4 from 24?		6 × 4=	24 ÷ 4=	1 fourth of 24=
6. 4 6's?	6 from 24?		4 × 6=	24 ÷ 6=	1 sixth of 24=
7. 5 5's?	5 from 25?	25	5 × 5=	25 ÷ 5=	1 fifth of 25=
8. 9 3's?	3 from 27?	27	9 × 3=	27 ÷ 3=	1 third of 27=
9. 3 9's?	9 from 27?		3 × 9=	27 ÷ 9=	1 ninth of 27=
10. 7 4's?	4 from 28?	28	7 × 4=	28 ÷ 4=	1 fourth of 28=
11. 4 7's?	7 from 28?		4 × 7=	28 ÷ 7=	1 seventh of 28=
12. 10 3's?	3 from 30?	30	10 × 3=	30 ÷ 3=	1 third of 30=
13. 3 10's?	10 from 30?		3 × 10=	30 ÷ 10=	1 tenth of 30=
14. 6 5's?	5 from 30?		6 × 5=	30 ÷ 5=	1 fifth of 30=
15. 5 6's?	6 from 30?		5 × 6=	30 ÷ 6=	1 sixth of 30=

b. Find the number omitted in each of these exercises:

3×7=	×4=28	27= × 9	5=1 sixth of
8×3=	÷8= 3	24= × 3	4=1 seventh of
6 4's=	÷7= 4	25= × 5	7=1 third of
27÷3=	÷5= 6	30= ×10	=1 fourth of 24.
30÷6=	÷3= 7	21= × 7	=1 ninth of 27.

c. 1. Add from 0 to 30, and then subtract from 30 to 0, by 3's. By 10's. By 5's. By 6's.

How many hatchets	How many hammers
2. Are 10 times 3 hatchets?	4. Are 6 times 5 hammers?
3. Are 3 times 10 hatchets?	5. Are 5 times 6 hammers?
30 brads are	30 awls are
6. How many times 3 brads?	8. How many times 5 awls?
7. How many times 10 brads?	9. How many times 6 awls?

IV. In these exercises the highest number must not exceed 100.

a. 1. Count up, by 1's, from 0 to 100.
2. Count down, by 1's, from 100 to 0.

b. 1. Add by 2's from 0 to 100. 2. From 1 to 99.
3. Subtract by 2's from 100 to 0. 4. From 99 to 1.

c. 1. Add by 3's from 0. 2. From 1. 3. From 2.
4. Subtract by 3's from 100. 5. From 99. 6. From 98.

V. Combinations.

1. 24+5,−10,+7,−4,+8,−7,÷6=how many?
2. 4×7−6,+3,÷5,×6,−4,+3=how many times 4?
3. Seven 3's,+ two 2's,− five 1's = what part of 30?
4. To 21 add 1 third of 21, divide by 1 sixth of 24, subtract 1 fifth of 25, and multiply by 1 third of 30.

VI. Applications.

1. Albert bought a knife for 21 cents, and sold it so as to gain 5 cents. How much did he get for it?

2. *4 weeks* are 28 days. One week is how many days?

3. A quire of paper is 24 sheets. If I use 5 sheets of a quire, how many sheets will be left?

4. Oliver, having 25 cents, paid 10 cents for a ball, and 7 cents for a club. How many cents had he left?

5. Jared's father gave him 3 dimes, and he spent 4 cents. How many cents had he then?

6. How much will a set of 6 parlor chairs cost, at 5 dollars apiece?

7. A girl bought some fruit for 9 cents, and spent 1 third of her money. How much money had she?

8. How much do 4 6-pound cakes of maple sugar weigh?

9. Twenty-five cents are how many half-dimes?

10. 3 loads of hay will winter 1 cow, 30 loads will winter how many cows? 21 loads will winter how many cows?

WRITE AND ADD

1	2	3	4	5	6	7	8
8	5	4	6	7	9	4	9
3	8	5	2	2	8	7	4
2	7	6	8	5	3	1	0
4	6	7	5	7	2	5	6
5	3	4	2	9	6	7	8

WRITE AND MULTIPLY

1	2	3	4
3	5	8	4
7	5	3	6

5	6	7	8
3	4	3	5
9	7	10	6

WRITE AND DIVIDE

1	2	3	4	5	6	7	8
4)24	7)28	5)25	7)21	6)30	9)27	3)24	10)30

30 to 10

I. **a.** 1. Add from 0 to 32, by 4's. By 8's.

2. To 35, by 5's. By 7's.

3. To 36, by 6's. By 4's. 9's.

4. To 40, by 4's. By 10's.

5. To 40, by 5's. By 8's.

6. Subtract to 0 from 32, by 4's. By 8's.

7. From 35, by 5's. By 7's.

8. From 36, by 6's. 4's. 9's.

9. From 40, by 4's. By 10's.

10. From 40, by 5's. By 8's.

b. 1. How many are 6 times 6 pinks?
2. 8 times 4 tulips?
3. 4 times 8 tulips?
4. 7 times 5 daisies?
5. 5 times 7 daisies?
6. 9 times 4 pinks?
7. 4 times 9 pinks?
8. 10 times 4 lilies?
9. 4 times 10 lilies?
10. 8 times 5 lilies?
11. 5 times 8 lilies?

c. 32 tulips are
1. How many times 4 tulips?
2. How many times 8 tulips?

35 daisies are
3. How many times 5 daisies?
4. How many times 7 daisies?

5. 36 pinks are how many times 6 pinks?
6. How many times 4 pinks?
7. How many times 9 pinks?

40 lilies are
8. How many times 4 lilies?
9. How many times 10 lilies?
10. How many times 5 lilies?
11. How many times 8 lilies?

II.

a. How many are	**b.** How many times can you take
1. 8 4's?	4 from 32?
2. 4 8's?	8 from 32?
3. 7 5's?	5 from 35?
4. 5 7's?	7 from 35?
5. 9 4's?	4 from 36?
6. 4 9's?	9 from 36?
7. 6 6's?	6 from 36?
8. 10 4's?	4 from 40?
9. 4 10's?	10 from 40?
10. 8 5's?	5 from 40?
11. 5 8's?	8 from 40?

III. a. Copy and complete these Tables:

	MULTIPLICATION.	DIVISION.	EQUAL PARTS.
32	8× 4=	32÷ 4=	1 fourth of 32=
	4× 8=	32÷ 8=	1 eighth of 32=
35	7× 5=	35÷ 5=	1 fifth of 35=
	5× 7=	35÷ 7=	1 seventh of 35=
36	9× 4=	36÷ 4=	1 fourth of 36=
	4× 9=	36÷ 9=	1 ninth of 36=
	6× 6=	36÷ 6=	1 sixth of 36=
40	10× 4=	40÷ 4=	1 fourth of 40=
	4×10=	40÷10=	1 tenth of 40=
	8× 5=	40÷ 5=	1 fifth of 40=
	5× 8=	40÷ 8=	1 eighth of 40=

b: Find the number omitted in each of these exercises:

4× =32 | 4= ÷9 | =1 sixth of 36 | 5=1 of 35
7× =35 | 8= ÷4 | =1 fifth of 40 | 8=1 of 32
5× =40 | 5= ÷8 | =1 fourth of 40 | 9=1 of 36
9× =36 | 7= ÷5 | =1 eighth of 32 | 4=1 of 40

IV. Add by 4's,
1. From 0.
2. From 1.
3. From 2.
4. From 3.

Subtract by 4's,
5. From 100.
6. From 99.
7. From 98.
8. From 97.

V. Combinations.

1. $29 + 9, - 2, \div 9, + 4, \times 5, - 8, \div 8, + 5, \times 3, - 18, \times 4 =$ how many times 6?

2. $33 + 7, \div 5, \times 4, - 7,$ − 1 sixth of 36, + 1 fifth of 35 = how many times 8?

3. 1 half of 40, + 1 fifth of 40, + 1 fourth of 36, − 4 times 7 are how many less than eight 5's?

4. Multiply 4 by 7, add 3, subtract 2 times 5, divide by 3, multiply by 5, subtract 2 times 3, and divide by 9.

VI. Applications.

1. Isaac planted 4 hills of melons, putting 8 seeds in each hill. How many seeds did he plant?

2. How many spools of thread can I buy for 36 cents, at 6 cents a spool? How many spools at 9 cents a spool?

3. Five weeks are how many days?

4. A father gave 40 cents to his children, giving 1 dime to each child. How many children had he?

5. At 5 dollars a pair, how many pairs of window-blinds can I buy for 40 dollars?

6. A paper-hanger used 10 rolls of paper for a bedroom, and 27 rolls for a parlor. How many rolls did he use?

7. Of the 38 cars of a freight-train, 7 are empty. How many cars are loaded?

8. Of the loaded cars, 6 contain grain, and the others flour. How many cars contain flour?

9. A market-man took 34 geese to market. After selling 25, how many geese had he left?

10. A farmer has 18 bushels of wheat, 9 bushels of corn, *and 8 bushels of* oats. How many bushels of grain has he?

11. How many tires are there on the wheels of 9 wagons?

12. How many rods of fence will inclose a village lot that is 8 rods front and 10 rods deep?

WRITE AND SUBTRACT

1	2	3	4	5	6	7	8	9	10
29	25	28	37	34	36	40	30	40	40
7	1	4	5	3	6	9	10	20	30

11	12	13	14	15	16	17	18	19	20
33	37	21	26	35	23	37	28	34	39
5	9	3	8	7	11	14	15	21	24

WRITE AND MULTIPLY

1	2	3	4	5	6
4	5	6	10	7	8
9	8	6	4	5	4

WRITE AND DIVIDE

1	2	3	4	5
5)40	4)36	8)32	10)40	7)35

6	7	8	9	10
4)32	5)35	6)36	8)40	9)36

WRITE AND ADD

1	2	3	4	5
3	4	7	5	6
5	1	6	7	3
4	2	0	3	7
3	3	5	6	5
6	8	4	4	0
7	5	5	0	9
4	2	3	7	1
5	6	9	8	7

Write in columns and add

1. 6, and 9, and 7, and 5, and 8.
2. 8, and 5, and 4, and 9, and 3.
3. 10, 3, 2, 5, 4, 7, 1, and 6.
4. 1, 2, 3, 4, 5, 6, 7, and 8.
5. 3, 6, 2, 7, 8, 5, and 9.

Write and subtract

1. 5 from 29.
2. 4 from 37.
3. 6 from 40.
4. 7 from 32.
5. 9 from 26.
6. 15 from 36.
7. 23 from 28.
8. 21 from 38.
9. 19 from 39.
10. 10 from 40.

Write and multiply

1. 3 by 8.
2. 9 by 4.
3. 4 by 7.
4. 8 by 5. By 3.
5. 3 by 9. By 7.
6. 4 by 8. By 10.

Write and divide

1. 21 by 7.
2. 30 by 6.
3. 25 by 5.
4. 24 by 4. By 7.
5. 35 by 5. By 4.
6. 36 by 9. By 8.

10 to 50

I. a. 1. Add from 0 to 42, by 6's. By 7's.
2. To 45, by 5's. By 9's.
3. To 48, by 6's. By 8's.
4. To 49, by 7's.
5. To 50, by 5's. By 10's.
6. Subtract to 0 from 42, by 6's. By 7's.
7. From 45, by 5's. By 9's.
8. From 48, by 6's. By 8's.
9. From 49, by 7's.
10. From 50, by 5's. By 10's.

b. 1. How many are 7 times 7 candles?
2. 7 times 6 lamps?
3. 9 times 5 wicks?
4. 6 times 8 shades?
5. 5 times 10 mats?

c. 42 lamps are
1. How many times 6 lamps?
2. How many times 7 lamps?

45 wicks are
3. How many times 5 wicks?
4. How many times 9 wicks?

5. 49 candles are how many times 7 candles?

48 lamp-shades are
6. How many times 6 shades?
7. How many times 8 shades?

50 lamp-mats are
8. How many times 5 mats?
9. How many times 10 mats?

II.

a. How many are	**b.** How many times can you take
1. 7 6's?	6 from 42?
2. 6 7's?	7 from 42?
3. 9 5's?	5 from 45?
4. 5 9's?	9 from 45?
5. 8 6's?	6 from 48?
6. 6 8's?	8 from 48?
7. 7 7's?	7 from 49?
8. 10 5's?	5 from 50?
9. 5 10's?	10 from 50?

III. a. Copy and complete these Tables:

MULTIPLICATION.		DIVISION.	EQUAL PARTS.
42	7× 6=	42÷ 6=	1 sixth of 42=
	6× 7=	42÷ 7=	1 seventh of 42=
45	9× 5=	45÷ 5=	1 fifth of 45=
	5× 9=	45÷ 9=	1 ninth of 45=
48	8× 6=	48÷ 6=	1 sixth of 48=
	6× 8=	48÷ 8=	1 eighth of 48=
49	7× 7=	49÷ 7=	1 seventh of 49=
50	10× 5=	50÷ 5=	1 fifth of 50=
	5×10=	50÷10=	1 tenth of 50=

b. Find the number omitted in each of these exercises:

42 = × 6
48 = × 8
45 = *9's*

48 ÷ 6 =
50 ÷ 10 =
45 ÷ *9* =

÷ 5 = 10
÷ 9 = 5
÷ 7 = 6

= 1 tenth of 50
= 1 sixth of 48
= 1 seventh of 42

5 × = 45
42 ÷ = 7
10 × = 50

IV. 1. Add by 5's from 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. Subtract by 5's from 100.
7. From 99.
8. From 98.
9. From 97.
10. From 96.

V. Combinations.

1. 9 × 5, + 1 tenth of 40, − 6, + 3 and how many = 6 × 8?

2. 42 ÷ 6, × 7, − 1 fifth of 45, ÷ 8 + 4, + how many = 50?

3. 50 − 4, + 3, ÷ 7, × 5, + 10, − 5 are how many times 8?

4. Multiply 1 third of 27 by 5, add 1 fifth of 25, subtract 1 third of 24, divide by 41 minus 35, multiply by 4 plus 3; you have how many less than 8 times 6 plus 2?

VI. Applications.

1. From a cask containing 42 gallons of molasses, a grocer drew 5 gallons. How many gallons were left in the cask?

2. A fruit dealer having 48 oranges, sold 7 to 1 person and 9 to another. How many oranges had he left?

3. Forty-five school days are how many school weeks?

4. If a man can paint 6 wash-tubs in an hour, in how many hours can he paint 48 wash-tubs?

5. How many days will a tub of 49 pounds of butter last, in a hotel that uses 7 pounds a day?

6. How many working days are there in 7 weeks?

7. A boy paid 10 half-dimes for a pocket-knife. How many cents did the knife cost him?

8. How many wheels have 6 8-wheeled freight-cars?

9. A milk-man who had 36 cows, bought 7 more. How many cows had he then?

10. One week a chair maker made 36 kitchen chairs, 5 office chairs, and 3 rockers. How many chairs did he make?

11. Two men caught thirty-eight pike and nine bass at one haul of a seine. How many fish did they catch?

12. How many doves are 25 doves + 10 doves + 8 doves?

13. *7 times 5 doves + 6 doves?*

14. How many ducks are 44 ducks − 1 fifth of 40 ducks?

15. 8 times 6 ducks − 9 ducks?

WRITE AND ADD

1	2	3	4
20	25	32	21
30	13	16	25

5	6	7	8
10	24	15	16
20	13	13	12
10	12	20	11

9	10	11	12	13	14
5	8	9	9	3	3
3	6	2	6	9	7
9	7	4	0	2	7
4	5	7	7	7	7
7	4	6	9	5	7
3	6	9	0	8	7
5	9	5	9	7	7
7	5	3	8	6	4

WRITE AND SUBTRACT

1	2	3	4
47	40	45	42
5	8	8	7

5	6	7	8
50	44	43	49
20	14	21	18

9	10	11	12
48	46	41	44
13	34	21	12

WRITE AND MULTIPLY

1	2	3	4
6	5	8	10
7	9	6	5

WRITE AND DIVIDE

1	2	3
6)42	7)49	5)45

4	5	6
8)48	6)47	10)50

50 to 70

I. a. 1. Add from 0 to 54, by 6's. By 9's.

2. To 56, by 7's. By 8's.

3. To 60, by 6's. By 10's.

4. To 63, by 7's. By 9's.

5. To 64, by 8's.

6. To 70, by 7's. By 10's.

7. Subtract to 0 from 54, by 6's. By 9's.

8. From 56, by 7's. By 8's.

9. From 60, by 6's. By 10's.

10. From 63, by 7's. By 9's.

11. From 64, by 8's.

12. From 70, by 7's. By 10's.

b. 1. How many are 8 times 8 watches?

2. 9 times 6 trunks?

3. 7 times 8 chests?

4. 10 times 6 canes?

5. 6 times 10 canes?

6. 7 times 9 mirrors?

7. 10 times 7 clocks?

c. 54 trunks are

1. How many times 6 trunks?
2. How many times 9 trunks?

60 canes are

5. How many times 6 canes?
6. How many times 10 canes?

56 chests are

3. How many times 7 chests?
4. How many times 8 chests?

63 mirrors are

7. How many times 7 mirrors?
8. How many times 9 mirrors?

9. 64 watches are how many times 8 watches?
10. 70 clocks are how many times 7 clocks?
11. 70 clocks are how many times 10 clocks?

II. **III. a.** Copy and complete these Tables:

a. How many are	**b.** How many times can you take	MULTIPLICATION.		DIVISION.	EQUAL PARTS.
1. 9 6's?	6 from 54?	54	9× 6=	54÷ 6=	1 sixth of 54=
2. 6 9's?	9 from 54?		6× 9=	54÷ 9=	1 ninth of 54=
3. 8 7's?	7 from 56?	56	8× 7=	56÷ 7=	1 seventh of 56=
4. 7 8's?	8 from 56?		7× 8=	56÷ 8=	1 eighth of 56=
5. 10 6's?	6 from 60?	60	10× 6=	60÷ 6=	1 sixth of 60=
6. 6 10's?	10 from 60?		6×10=	60÷10=	1 tenth of 60=
7. 9 7's?	7 from 63?	63	9× 7=	63÷ 7=	1 seventh of 63=
8. 7 9's?	9 from 63?		7× 9=	63÷ 9=	1 ninth of 63=
9. 8 8's?	8 from 64?	64	8× 8=	64÷ 8=	1 eighth of 64=
10. 10 7's?	7 from 70?	70	10× 7=	70÷ 7=	1 seventh of 70=
11. 7 10's?	10 from 70?		7×10=	70÷10=	1 tenth of 70=

b. Find the number omitted in each of these exercises:

56÷ =7
63÷ =9
54÷ =6
70÷ =7
60÷ =6

7=1 eighth of
10=1 sixth of
6=1 ninth of
9=1 seventh of
7=1 tenth of

9× 7=
6×10=
7× 8=
× 9=54
× 7=56

÷6=10
÷8= 8
÷9= 7
÷7=10
÷6= 9

IV. a. Add by 6's

1. From 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. From 5.

Subtract by 6's

7. From 100.
8. From 99.
9. From 98.
10. From 97.
11. From 96.
12. From 95.

b. 1. Add by 7's from 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. From 5.
7. From 6.
8. Subtract by 7's from 100.
9. From 99.
10. From 98.
11. From 97.
12. From 96.
13. From 95.
14. From 94.

V. Combinations.

1. 48 + 8, ÷ 7, + 2, × 5, + 9, − 10, − 7, + 9 = how many?

2. 8 × 8, + 6, ÷ 10, × 9, − 9, + 7, = 70 − how many?

3. Six 7's, + three 3's, + 5, ÷ 7, ÷ 4, × 5 × 5 are how many less than nine 6's + one 5?

4. 6 10's, + 2 4's, − 5, ÷ 3 3's, × 5 2's = how many 7's?

5. 59 − 1 seventh of 49, + 1 fourth of 20, − 3 times 3, ÷ 1 half of 16, × 2 times 5, − 1 fifth of 25 = how many?

6. 70 − 1 half of 20, + 1 half of 14, − 4, ÷ 7, × 6, + 1 half of 12 are how many less than 10 × 7?

7. From 7 times 8 take 1 half of 8, add 1 fourth of 28, subtract seven 7's, and multiply by 1 fifth of 35.

VI. Applications.

1. How many 6-cent stamps can I buy for 54 cents?

2. Irene used 60 skeins of worsted in making 6 lamp mats. How many skeins did she use for 1 mat?

3. If a woman makes 63 vests in 7 weeks, how many vests does she make in 1 week?

4. A cooper used 54 feet of hoop iron for 9 hoops. How many feet did he use for a hoop?

5. If a girl can iron 7 pairs of cuffs in an hour, how many pairs can she iron in 8 hours?

6. How many pickets are in 8 gates of 8 pickets each?

7. If 7 yards of cambric can be bought for 1 dollar, how many yards can be bought for 9 dollars?

8. A newsboy sold 65 papers; 7 of them were weeklies, and the others were dailies. How many dailies did he sell?

9. A man set out 54 fruit-trees, and 6 of them died. How many lived?

10. A farmer had 69 sheep, and he sold 7 of them. How many sheep had he left?

11. A boy tied a string 8 yards long to a kite string 44 yards long. How many yards long was the whole?

12. Louis had 61 walnuts, and Rufus had 7 more than Louis. How many walnuts had Rufus?

WRITE AND ADD

1	2	3	4
23 cows	34 oxen	37 deer	24 pigs
21 cows	12 oxen	30 deer	33 pigs
14 cows	22 oxen	11 deer	12 pigs

WRITE AND MULTIPLY

1	2	3	4
6 bars	8 posts	10 carts	9 loads
9	8	6	7

WRITE AND SUBTRACT

1	2	3	4
57 men	69 boys	56 cents	65 pins
32 men	27 boys	36 cents	41 pins

WRITE AND DIVIDE

1	2	3	4
7)56 eggs	9)63 figs	6)54 pens	7)70 cents

WRITE AND ADD

1	2
12 kegs	23 tubs
30 kegs	11 tubs
13 kegs	14 tubs
14 kegs	10 tubs

3	4	5	6
9	7	9	9
5	8	7	8
8	9	9	9
6	8	6	8
7	7	8	2
8	6	5	9
9	5	7	8
5	4	9	9
7	3	8	8

Write and complete these exercises:

1. 53− 9=
2. 9× 7=
3. 68− 7=
4. 56÷ 7=
5. 70−30=
6. 60÷ 6=
7. 8× 8=
8. 9+8+8+9+9+8=
9. 7+6+8+9+8+7+6+9=
10. 8+5+6+9+7+6+4+8+9+3=
11. 10+7+9+8+5+9+6+8+3+5=
12. 3+8+7+7+7+7+8+8+7+7=
13. 23+11+20+14=
14. 10+13+11+20+15=
15. 62− 8=
16. 6× 9=
17. 54÷ 9=
18. 58−35=
19. 69−24=
20. 63÷ 7=

70 to 100

I. a. 1. Add from 0 to 72, by 8's. By 9's.
2. To 80, by 8's. By 10's.
3. To 81, by 9's.
4. To 90, by 9's. By 10's.
5. To 100, by 10's.
6. Subtract to 0 from 72, by 8's. By 9's.
7. From 80, by 8's. By 10's.
8. From 81, by 9's.
9. From 90, by 9's. By 10's.
10. From 100, by 10's.

b. How many are
1. 8 times 9 trees?
2. 10 times 8 bushes?
3. 10 times 9 plants?
4. 10 times 10 stumps?

c. 72 trees are
1. How many times 8 trees?
2. How many times 9 trees?

80 bushes are
3. How many times 8 bushes?
4. How many times 10 bushes?
5. 81 shrubs are how many times 9 shrubs?
6. 90 plants are how many times 9 plants?
7. How many times 10 plants?
8. 100 stumps are how many times 10 stumps?

II.

a. How many are	**b.** How many times can you take
1. 9 8's?	8 from 72?
2. 8 9's?	9 from 72?
3. 10 8's?	8 from 80?
4. 8 10's?	10 from 80?
5. 9 9's?	9 from 81?
6. 10 9's?	9 from 90?
7. 9 10's?	10 from 90?
8. 10 10's?	10 from 100?

III. a. Copy and complete these Tables:

MULTIPLICATION.		DIVISION.	EQUAL PARTS.
72	9× 8=	72÷ 8=	1 eighth of 72=
	8× 9=	72÷ 9=	1 ninth of 72=
80	10× 8=	80÷ 8=	1 eighth of 80=
	8×10=	80÷10=	1 tenth of 80=
81	9× 9=	81÷ 9=	1 ninth of 81=
90	10× 9=	90÷ 9=	1 ninth of 90=
	9×10=	90÷10=	1 tenth of 90=
100	10×10=	100÷10=	1 tenth of 100=

b. Find the number omitted in each of these exercises:

9=1 of 72
8=1 of 80
10=1 of 90
10=1 of 100

× 9=81
× 8=72
×10=90
× 8=80

÷ 8=10
÷10= 9
÷ 9= 8
÷10=10

80÷ =10
72÷ = 9
9× =81
10× =90

IV. a. Add by 8's

1. From 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. From 5.
7. From 6.
8. From 7.

Subtract by 8's

9. From 100.
10. From 99.
11. From 98.
12. From 97.
13. From 96.
14. From 95.
15. From 94.
16. From 93.

b. Add by 9's

1. From 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. From 5.
7. From 6.
8. From 7.
9. From 8.

Subtract by 9's

10. From 100.
11. From 99.
12. From 98.
13. From 97.
14. From 96.
15. From 95.
16. From 94.
17. From 93.
18. From 92.

c. Add by 10's

1. From 0.
2. From 1.
3. From 2.
4. From 3.
5. From 4.
6. From 5.
7. From 6.
8. From 7.
9. From 8.
10. From 9.

Subtract by 10's

11. From 100.
12. From 99.
13. From 98.
14. From 97.
15. From 96.
16. From 95.
17. From 94.
18. From 93.
19. From 92.
20. From 91.

V. Combinations.

1. $3\times3\times8,+2\times2,-6,\div7,\times8,-4=72+$ how many?
2. $8\times9,+8+8-9,-7,\div8,\times10=$ how many 9's?
3. $9\times9,+10+6-7,\div10$ is 1 seventh of what number?
4. 75+1 fifth of 25,—1 third of 18,+5,—1 third of 27,+1 sixth of 48 is how many times 10?
5. 9 9's+2 2's,—5 3's,÷7, × 9,—2 4's is how many 8's?
6. From 8 times 10 plus 7 take 9 times 9 plus 1, add 5, multiply by 9, subtract 9, and divide by 9.
7. 10 times 10,—1 half of 10,—7,—7,÷3 times 3,—1, ×10+2 times 2 is how many less than 93?

VI. Applications.

1. If I travel 71 miles by railroad, and 8 miles by stage, how many miles do I travel?
2. If I gain 8 dollars by selling a wagon for 98 dollars, *how much does* the wagon cost me?

3. A man paid 83 dollars for a horse, and 9 dollars for a saddle. How much did he pay for both?

4. Ten cents which Horace paid for a spelling book was one eighth of his money. How much money had he?

5. If 2 tinsmiths can make 4 basins each in an hour, how many basins can they make in 10 hours?

6. A farmer, having 81 bushels of potatoes, planted 1 ninth of them. How many bushels did he plant?

7. He sold the others. How many bushels did he sell?

8. How many 10-dollar bills must I give for a horse that costs 100 dollars?

WRITE AND ADD

1	4
13	312
31	123
24	231

2	5
34	423
43	215
12	340

3	6
22	201
13	130
40	115
23	352

7	8	9
6	8	7
2	7	8
7	5	9
5	9	8
8	8	6
7	7	9
9	9	7
8	8	9
6	6	6
5	7	7
9	8	9
7	4	8

WRITE AND MULTIPLY

1	2	3	4	5
8	9	9	10	10
9	10	9	8	10

WRITE AND SUBTRACT

1	2	3	4
78	89	295	473
25	63	182	240

5	6	7	8
96	74	687	599
51	34	383	107

WRITE AND DIVIDE

1	2	3	4
9)90	8)72	9)81	10)100

1. Add 9, 8, 7, 8, 7, 6, 7, 6, 5, 6, 7, 8.
2. Add 7, 9, 6, 8, 9, 9, 9, 7, 8, 8, 9, 10.
3. Add 32, 43, 24.
4. Add 203, 320, 456.
5. Subtract 32 from 88.
6. Subtract 271 from 394.
7. Multiply 8 by 10.
8. Multiply 9 by 8.
9. *Divide 92 by 9.*
10. Divide 87 by 10.
11. Divide 76 by 8.

REVIEW

A. Drills in rapid counting. (See page 78.)

3 3 3
3 **3**
3 **3**
3 Add to **3**
3 and subtract from **3**
3 **100** **3**
3 **3**
3 **3**
3 3 3

b **3 3 3 3 3** *c*
2 **4**
2 Add to **4**
2 and subtract from **4**
2 **100** **4**
2 **4**
a **5 5 5 5 5** *d*

B. 1. A basket maker made 19 willow baskets, and sold 14 of them. How many baskets had he left?

2. How many double desks will 50 pupils require?

3. A clerk, after paying 20 dollars a month for his board, has 1 half of his month's wages left. How much does he earn in a month?

4. A grocer sold 30 barrels of salt, which was 1 half as many barrels as he had left. How many barrels had he at first?

5. One day a hotel steward bought 23 pounds of beef, 10 pounds of veal, 9 pounds of lamb, and 12 pounds of fish. How many pounds of meat did he buy?

6. How many pounds more of meat than of fish did he buy?

7. If I divide 49 plums equally among 7 children, what part of the 49 plums will I give to each child?

8. How many plums will I give to each child?

9. How many plums will I give to 4 of the children?

10. Alice paid 6 cents for some ink, 1 sixth as much for a pen, and 1 half as much for some paper. How many cents did she pay out?

11. Jay writes 4 lines in his copy-book each day. In how many days will he write 5 pages of 12 lines each?

12. In a pasture are 54 cows and 9 oxen. What part of all the cattle in the field are oxen?

13. If I pay 1 cent for 8 cherries, how many cents must I pay for 72 cherries?

C. Copy and complete these exercises:

1. $35+3+7=$
2. $80-7=$
3. $3\times9+7-5=$
4. $30\times2=$
5. $59-4=$
6. $4+3\times2+25=$
7. $12+10+3+4=$
8. $18\div2=$
9. $3+2\times2+30=$
10. $2\times2\times2+70-5=$
11. $58-5=$
12. $3\times2+24=$
13. $86+2+0+9=$
14. $56\div7=$
15. $3+2\times2\times10=$
16. $4\times20=$
17. $69-4-15\times2=$
18. $45\div5\times8=$
19. $57+0+2\times0=$
20. $49\div7+13\times4=$
21. $54\div9+\quad-\quad+2=13$
22. $3\times30-9\div\quad=9$
23. $77-74+62-\quad=60$
24. $28\div4+3\times2\times\quad=60$
25. $54+6+\quad+11\quad=84$
26. $100\div5,\div5\times\quad=12$
27. $13+4+10\div\quad=9$
28. $20+4+30-\quad=14$
29. $5+14-7+4-\quad=11$
30. $81-3+2+20\div\quad=10$

D. 1. Name each two numbers that equal 11. Thus:

11 equals 1 and 10, or 2 and 9, or 3 and 8, or 4 and 7, or 5 and 6.

Name each two numbers

2. That equal 12.
3. That equal 13.
4. That equal 14.
5. That equal 15.
6. That equal 16.
7. That equal 17.
8. That equal 18.
9. That equal 19.
10. That equal 20.

E. 1. 1 half of 20, + 1 half of 40, + 1 half of 60, + what number = 70?

2. 1 half of 40 and 1 fourth of 20 are how many times 5?

3. 9 × 5, − 2 × 4 are how many less than 6 × 7, + 3?

4. 1 half of 16, plus 2 times 1 fourth of 12 are how many times 7?

5. From 59 plus 2 times 3, take 9 times 1 seventh of 35.

6. 4 times 1 fifth of 40 is how many less than 61 − 9?

7. 41 − 1 half of 16 = how many times 4?

8. What number is 9 more than 8 times 1 seventh of 42?

9. 29 = two 4's + five 3's + how many 2's?

10. 39 minus five 2's are how many 3's?

11. What is the difference between 6 times 9 plus 5, and 8 times 8 minus 5?

F. Write and multiply

1. 8 by 7.
2. 9 by 6.
3. 11 by 8.
4. 21 by 4.
5. 132 by 3.
6. 243 by 2.

Write and subtract

1. 52 from 87.
2. 31 from 68.
3. 40 from 99.
4. 26 from 76.
5. 230 from 530.
6. 157 from 458.
7. 316 from 846.
8. 542 from 585.

Write and divide

1. 63 by 7.
2. 90 by 9.
3. 80 by 2.
4. 69 by 3.
5. 48 by 4.
6. 100 by 10.

Write and add

1	2	3	4	5
7	4	9	6	9
1	9	8	7	9
4	6	3	4	9
8	5	8	6	8
2	7	7	7	7
5	2	8	5	7
9	8	9	6	7
0	3	6	7	8
3	9	8	3	6
6	4	7	6	9
8	6	4	7	7
5	8	5	2	8

Write in columns and add

1. 3, 7, 7, 7, 7, 7, 8, 8, 8, 3, 3, 3, 9, 9, 6, 6, 9, and 6.
2. 4, 8, 5, 6, 6, 6, 6, 6, 6, 6, 4, 4, 4, and 4.
3. 5, 8, 8, 8, 8, 8, 3, 9, 9, 9, 9, 9, 7, 3, 5, and 7.
4. 1, 4, 9, 2, 5, 8, 0, 7, 6, 3, 5, 8, 0, 4, 7, and 9.

SUGGESTIONS TO TEACHERS

Page 101.—If pupils find difficulty in writing numbers of more than three figures so that units of the same order shall stand in the same column, write for them, or allow them to write, two periods of ciphers, and under these require them to write the numbers.

$$\begin{array}{r} 000,000 \\ 374 \\ 25,169 \\ 316,532 \end{array}$$

Page 106.—If pupils are slow in comprehending any of the written processes—addition, multiplication, subtraction, division—illustrate by using objects. Thus: Represent ones by single objects; tens by the same kind of objects in groups of 10; hundreds by the same kind of objects in groups of 100 (10 tens each). Then, using the objects, and the figures to represent the objects, in connection, any one of the written processes can be made plain and interesting. Cents, dimes, and dollars are objects well suited for use as above suggested.

Require the pupil to explain each step in the written work, by explanations similar to those given on pages 106, 109, 110, 112, and 116, till he is familiar with them. Afterward allow him to omit the explanations of the several steps in the process, and to give only such explanations of operations and processes as the conditions of the question solved may require.

In Adding.—Train pupils to name each partial result as they point successively to the figures added. Thus: 12, 18, 27.

$$\begin{array}{r} 9 \\ 6 \\ 5 \\ 7 \\ \hline \end{array}$$

In Subtracting.—Teach pupils to perform the process mentally, and to name the partial results. Thus: Looking at the 7 and 1, the pupil says 6; looking at the 0 and 3, he says 7; looking at the 4 and 5, he says 8; and looking at the 8 and 6, he says 1.

$$\begin{array}{r} 8,407 \\ 6,531 \\ \hline 1,876 \end{array}$$

In Multiplying and Dividing.—Train the pupils to proceed in a manner similar to the above.

Page 112, Art. 4, Ex. 12, 13.—By the aid of objects, show that 1 ten and 3 ones are 13 ones, and that 4 tens and 3 ones are 3 tens and 13 ones.

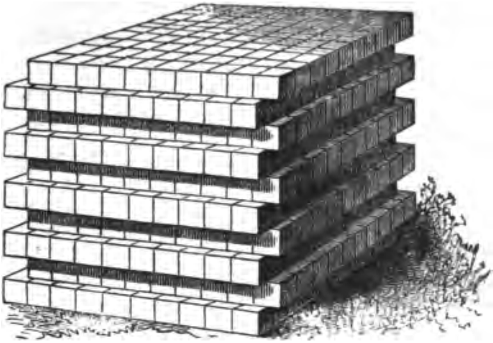
Page 117, Art. 7.—Teach pupils to state the steps in division. Thus:

1*st.* I *divide*, to obtain the quotient figure.

2*d.* I *multiply*, to find the part of the dividend used.

3*d.* I *subtract*, to find the part of the dividend not used.

4*th.* I *bring down* (or annex) *the next dividend figure*, to form the next *partial dividend.*



10
hundreds
are
1 thousand.

THOUSANDS

I. 1. In this picture, how many blocks are there in one row of the top layer?

2. How many rows of blocks are in the top layer?

3. How many blocks are in the top layer?

4. How many hundred blocks are there in 2 layers?

5. 3 layers?
6. 4 layers?
7. 5 layers?
8. 6 layers?
9. 7 layers?
10. 8 layers?
11. 9 layers?
12. 10 layers?

II. *Ten hundreds* taken together are *one thousand.*

a. The thousands are expressed by figures, thus:

One thousand,	1,000	Four thousand,	4,000	Seven thousand,	7,000
Two thousand,	2,000	Five thousand,	5,000	Eight thousand,	8,000
Three thousand,	3,000	Six thousand,	6,000	Nine thousand,	9,000

b. Write in words and read

1. 4,000
2. 2,500
3. 5,910
4. 7,090
5. 3,091
6. 6,204
7. 4,007
8. 8,123
9. 2,460
10. 1,050
11. 3,708
12. 9,999

c. Write these numbers in figures:

1. Four thousand fifty.
2. Seven thousand two.
3. Three thousand nine hundred.
4. One thousand five hundred sixty.
5. Two thousand one hundred thirty.
6. Eight thousand three hundred twenty-five.
7. Five thousand twenty-seven.

III. *Ten thousands* taken together are *one ten-thousand.*

Ten thousand is expressed by figures thus: 10,000

Express by figures
1. Twenty thousand.
2. Thirty thousand.
3. Forty thousand.
4. Fifty thousand.
5. Sixty thousand.
6. Seventy thousand.
7. Eighty thousand.
8. Ninety thousand.

IV. Ten *ten-thousands* taken together are *one hundred-thousand.*

a. 1. Express by figures one hundred-thousand, 100,000
2. Two hundred-thousand.
3. Three hundred-thousand.
4. Four hundred-thousand.
5. Five hundred-thousand.
6. Six hundred-thousand.
7. Seven hundred-thousand.
8. Eight hundred-thousand.
9. Nine hundred-thousand.

b. Read these numbers:
18,563 | 47,200 | 240,000 | 500,375 | 744,006
32,008 | 60,420 | 408,000 | 652,010 | 853,576

V. a. In expressing numbers by figures,

Ones are expressed by one figure;
Tens, by two figures;
Hundreds, by three figures;
Thousands, by four figures;
Ten-thousands, by five figures;
Hundred-thousands, by six figures.

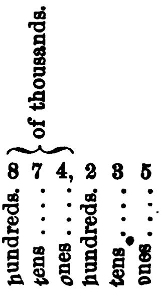
b. When you express numbers by figures,.

1. In what place do you write tens? Ten-thousands? Hundreds?
2. In what place do you write thousands? Ones? Hundred-thousands?
3. What figures stand in the second place? Fourth place? Sixth place?
4. What figures stand in the first place? Third place? Fifth place?

c. Each of these three numbers expresses how many
1. Hundred-thousands?
2. Thousands?
3. Ten-thousands?
4. Hundreds?
5. Tens?
6. Ones?

2,906
30,548
407,000

VI. Every three figures in a number, counting from the right, are a **period.** Periods of figures are separated from each other by commas. The first or right-hand period consists of ones, tens, and hundreds; and the second period, of *ones, tens,* and hundreds of thousands.



VII. a. Copy, learn, and recite this table:

10 ones are 1 ten.	1 ten is 10 ones.
10 tens are 1 hundred.	1 hundred is 10 tens.
10 hundreds are 1 thousand.	1 thousand is 10 hundreds.
10 thousands are 1 ten-thousand.	1 ten-thousand is 10 thousands.
10 ten-thousands are 1 hundred-thousand.	1 hundred-thousand is 10 ten-thousands.

b. Copy and read these numbers:

15,380
26,506
50,041
132,087
270,405
400,500
100,905
904,306
803,000
200,040
600,002
503,020
793,461
56,974
855,763

c. Express these numbers by figures:

1. Sixteen thousand sixteen.
2. Ninety thousand five.
3. Eighty thousand twelve.
4. Seven hundred fifty thousand nine.
5. Seven hundred six thousand two hundred ninety-one.
6. Five hundred thousand two hundred fifty-six.

VIII. a. In expressing dollars and cents by figures,

1st. *Always place the dollar mark* ($) *before the number.*

2d. *Always place a decimal point* (.) *before the cents.*

3d. *Always place a cipher between the decimal point and any number of cents less than* 10.

Examples: $.75 is 75 cents; $.07 is 7 cents; $1.00 is 1 dollar or 100 cents; $25 is 25 dollars; $3.87 is 3 dollars and 87 cents; $21.08 is 21 dollars and 3 cents.

b. Copy and read these numbers:

$324
$2,175
$30,942
$.19
$.40
$.81
$15.36
$240.17
$1,506.94
$.01
$.04
$.09
$8.05
$104.03
$26,037.08

c. Express these numbers by figures:

1. Thirty cents.
2. Twelve cents.
3. Four cents.
4. Nine dollars.
5. Thirty-one dollars.
6. Five hundred dollars.
7. Nine thousand dollars.
8. Fifty-six cents.
9. Eight dollars and seventeen cents.
10. Forty-three dollars and fifty cents.
11. One thousand ten dollars and ten cents.
12. Twelve thousand five dollars and six cents.

ADDITION

1. The number found by adding, is called the *sum*, or *amount*.

What is the sum of
1. 40, 10, 5, 8, 6, 9, and 7?
2. 65, 9, 4, 5, 7, and 10?
3. 31, 7, 7, 7, 7, 7, 7, and 7?
4. 15+8+9+6+7+4+5?
5. 59+3+7+10+9+2?

Find the amount of
6. 12, 8, 20, 7, 10, and 4.
7. 72, 7, 5, 9, 6, and 8.
8. 84+8+3+4+7+9.
9. 10+97+5+6+3+4.
10. 100, 30, 10, 7, 9, 8, 6, and 5.

11. Henry gave 15 walnuts to some girls, 8 to some boys, and kept 7. How many walnuts had he at first?

He had the sum of 15 walnuts, 8 walnuts, and 7 walnuts which is 30 walnuts.

12. Ezra bought some marbles. He sold 6, lost 4, and had 15 left. How many marbles did he buy?

13. A man paid $65 for a wagon, and $7 for repairs, and sold it at a profit of $8. How much did he receive for it?

14. One man owes me $45, another owes me $9, and another $7. How many dollars do the 3 men owe me?

15. A woman paid $.50 for sugar, $.16 for crackers, and $.09 for starch. How many cents did she pay out?

2. How many are

1. 34 plums, 7 plums, 5 plums, 9 plums, and 10 plums?
2. 47 ducks, 8 ducks, 5 ducks, and 20 ducks?
3. $15, $8, $5, $9, $2, $10, and $7?
4. $.20+$.12+$.08+$.10+$.04+$.09?
5. 72 hats+6 hats+9 hats+5 hats+10 hats+8 hats?
6. 30 eggs, 20 eggs, 12 eggs, 9 eggs, and 7 eggs?
7. 13 cows, 7 cows, 40 cows, 8 cows, and 7 cows?
8. $27, $8, $6, $9, $15, $10, $8, and $4?
9. $.56, $.07, $.09, $.08, $.20, $.13, and $.06?
10. 26+8+6+15+10+7+4+9+3+8?

11. One day a butcher bought 23 lambs, 8 lambs, and 10 lambs. How many lambs did he buy?

12. Alfred is 15 years old, Edwin is 11, and Oscar is 9. What is the sum of their ages?

13. A hunting party shot 50 pigeons, 9 ducks, 10 snipes, and 6 partridges. How many birds did they shoot?

14. Jane paid $.80 for calico, $.14 for cambric, $.06 for a thimble, and $.08 for thread. How much did she pay out?

15. Three men bought a horse, the first man paying $35, the second man $15, and the third man as much as the first two. How much did the horse cost?

3.

How many are	Add	Find the sum of
1. 32, 9, and 7?	3. 65, 6, and 9.	5. 98+7+15.
2. 54, 5, and 11?	4. 87+8+9.	6. 67+12+11.

7. A railroad train carried 45 men, 15 women, 7 children, and 9 train hands. How many persons were on the train?

8. Enos gave 18 apples for a kite, 12 for a string, 8 for a ball, and 5 for a club. How many apples did he trade away?

9. What is the sum of $.62, $.08, $.14, $.07, and $.09?

10. What is the amount of $100+$27+$8+$10+$5?

4. In adding numbers, *add ones to ones*, *tens to tens*, *hundreds to hundreds*, and so on.

	1	2	3	4	5	6	7	8
	51	72	$21	$.30	512	723	$214	$7.61
	63	90	62	.81	631	902	621	8.10
	80	52	13	.12	802	520	403	1.23
	74	35	40	.76	743	351	130	3.02
Sum,	268		$	$			$	$

9	10	11	12	13
3,214	85,213	$611.53	923,141	$5,214.03
8,141	72,102	903.21	712,310	8,141.32
7,320	90,321	852.13	531,412	9,320.30
2,013	61,153	721.02	803,023	8,010.21

5. For convenience, write numbers to be added with *ones under ones*, *tens under tens*, *hundreds under hundreds*, and so on.

1. Add 5,321; 8,103; 6,320; and 9,243.
2. Add 735,242; 421,303; and 540,134.
3. Add $812, $6, $30, $904, $751.
4. Add $12.30, $71.42, $50.11, and $65.06.

6. EXAMPLE.—What is the sum of 65, 48, 92, 86, and 57?

EXPLANATION.—*1st.* I write the numbers, ones under ones, and tens under tens, and draw a line below the last number.

2d. I add the ones, thus: thirteen, fifteen, twenty-three, twenty-eight,—and write the 8 ones below the line, for the ones of the required sum. The 2 tens are to be added with the tens of the given numbers.

3d. Beginning with the 2 tens of the 28, I next add the tens, thus: seven, fifteen, twenty-four, twenty-eight, thirty-four,—and write the sum of this column, 34 tens (=4 tens and 3 hundreds), for the tens and hundreds of the required sum.

The result, 348, is the sum required.

1	2	3	4	5	6	7	8
89	94	58	895	489	874	169	8,957
76	37	95	768	376	568	495	7,686

9	10	11	12	13	14	15
49	$87	457	$274	695	4,576	$6,876
38	34	283	8	715	2,849	9,587
56	65	69	567	28	7,694	2,743

16	17	18	19	20	21
587	$4.95	3,652	$52.38	89	$ .56
349	7.38	746	1.54	2,874	45.67
65	.63	4,839	60.49	19,568	234.00
278	3.82	57	.72	957	6.08
54	2.00	2,690	7.43	16,371	567.89

7. 1. In what year will a person who was born in the year 1825, be 67 years old?

2. A man bought a house, paying $1,150 down, and $275 yearly for 6 years. How much did the house cost him?

3. A has $675, B has $954, C has $728, and D has as much as A, B, and C. How many dollars has D?

4. What sum of money have the 4 men?

5. What is the weight of eight bales of cotton, weighing 485, 418, 389, 374, 473, 419, 496, and 408 pounds?

6. An ice company housed 18,263 tons in December, 15,967 tons in January, 174 tons in February, and 1,648 tons in March. How many tons did they house?

7. A merchant's sales on Monday amounted to $56.25; Tuesday, $45.63; Wednesday, $67.50; Thursday, $65.87; Friday, $24.08; and Saturday, $75. What was the amount of the week's sales?

MULTIPLICATION

1. The number found by multiplying, is called the *product.*

1. What is the product of 8 times 2? | 2. Of 4 times 9?
3. 5 times 8? | 4. 4 times 7? | 5. 3×7? | 6. 6×10?
7. Of 2 times 6 books? | 9. Of 10 times $8?
8. Of 9 times 5 dimes? | 10. Of 7 times $.09?

11. A rake has 10 teeth; how many teeth have 5 rakes?

Five rakes have five times as many teeth as one rake; and five times ten teeth are fifty teeth.

12. A blacksmith uses 8 nails in setting a horseshoe. How many nails does he use in shoeing a horse?

13. One gallon is four quarts. Seven gallons are how many quarts?

14. 1 peck is 8 quarts. 8 pecks of rye are how many quarts?

15. How many working days are there in 9 weeks?

2. 1. How much must be paid for 9 pocket-combs, at $.06 apiece?

2. For 6 quires of paper, at $.10 a quire?
3. For 8 pounds of potash, at $.07 a pound?
4. For 10 fat sheep, at $7 a head?
5. For 9 silk hats, at $4 each?
6. For 7 tons of coal, at $9 a ton?
7. For 6 cakes of soap, at $.04 a cake?
8. For 3 acres of land, at $20 an acre?

2 pints are 1 quart; 4 quarts are 1 gallon.

9. An 8-gallon keg will hold how many quarts?
10. A 4-gallon jar will hold how many quarts?
11. A 6-quart jug will hold how many pints?
12. A 10-quart pail will hold how many pints?
13. 2 gallons of oil are how many quarts? How many pints?
14. 3 quarts 1 pint of vinegar are how many pints?
15. 2 gallons 1 quart of milk are how many quarts? How many pints?

3. Multiply

1. 5 by 7, and add 4.
2. 4 by 3, and add 9.
3. 6 by 8, and add 5.
4. 3 by 2, and add 8.
5. 7 by 6, and add 3.
6. 8 by 9, and add 7.

7. What is the product of 4×5×2? Of 3×3×10? Of 2×5×4×5?

8. How many leaves are on 8 stems of 3-leaved clover?

9. A tailor's house rent is $6 a month, and his shop rent $4. How much rent does he pay in 9 months?

10. If the morning sessions are 3 hours, and the afternoon sessions 2 hours, how many hours is school in session in 2 weeks?

11. In 1 hour a man picks 5 bushels of apples, and a boy 3 bushels. How many bushels will both pick in 10 hours?

12. Eli's age, which is 7 years, is 1 seventh of his grandfather's age. How old is his grandfather?

13. A 3-bushel bag holds 1 ninth as much as my grain bin. How many bushels will fill the bin?

4. 3 times 52 are how many?

By adding.	By multiplying.
52	52
52	3
52	156
156	

Find the sums and the products of

1	2	3
32	43	61
4	3	7

4. 5 times 410.
5. 2 times 734.
6. 4 times $5.21.
7. 3 times $83.12.
8. 2 times $93.42.

5. Example.—Multiply 37 by 4.

37 Multiplicand
4 Multiplier
148 Product

Explanation.—*1st.* I write 37 for a multiplicand, and 4 under the 7 for a multiplier, and draw a line below.

2d. I multiply the ones. 4 7's, or 4 times 7, are 28,—and write the 8 ones below the line for the ones of the result.

3d. I multiply the tens. 4 times 3 tens are 12 tens, plus 2 tens (of the 28) are 14 tens, which I write as 4 tens and 1 hundred of the result.

The entire result, 148, is the product required.

	1	2	3	4	5
Multiplicand,	25	$.63	174	$8.32	$39.87
Multiplier,	7	9	3	5	8
Product,					

6	7	8	9	10	11
37	54	856	37	$.54	241
10	10	10	30	70	60

Multiply

12. 87 by 6.
13. $.44 by 3.
14. 257 by 10.
15. $568 by 4.
16. 7,123 by 8.
17. $61.25 by 2.
18. $34.719 by 7.
19. $197.82 by 5.

Annexing a cipher to a number multiplies the number by 10.

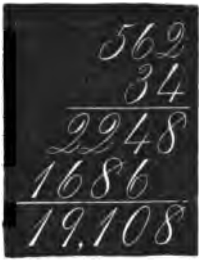
6. **Example.**—Multiply 562 by 34.

Explanation.—*1st.* I multiply 562 by 4, and obtain 2,248.

2d. I multiply 562 by 3 (tens), and obtain 1,686 (tens). I write 6, the first figure of this product, under the 4 tens of the first product.

3d. I add these two products.

The final result, 19,108, is the product required.



```
  562
   34
 2248
1686
19,108
```

Exercises combining written and oral work.

1	2	3	4	5
39	45	254	$176	$6.19
24	17	55	43	32

6	7	8	9
2,156	905	365 days	1,387 pounds
62	217	432	90

10. 47 times 142.
11. 75 times $238.
12. 80 × 6,340.
13. 24 × 7,516.
14. 132 times $32.45.
15. 9 times 24,975.
16. 16 × 80,037.

7. 24 hours are 1 day.
How many hours are
1. One week, or 7 days?
2. 4 weeks?
3. 8 days 15 hours?
4. 2 weeks 6 days?

365 days are 1 year.
How many days are
5. 5 years?
6. 32 years?
7. 10 years 75 days?
8. 48 years 200 days?

9. A tailor makes 4 coats a week, at $7 apiece. How much does he earn in 13 weeks?

10. A joiner worked 20 weeks, at $3 a day. How many dollars did he earn?

11. 196 pounds of flour are a barrel. How many pounds of flour are there in 36 loads of 15 barrels each?

12. How many yards of sheeting are there in 85 bales, each bale containing 28 pieces of 47 yards each?

13. How much must I pay for 2 horses at $144 each, *and 5 cows at $37.50* each?

SUBTRACTION

1. The number found by subtracting is called the *difference*, or *remainder*.

1. What is the difference between 38 and 5?
2. $72 and $3?
3. $.54 and $.47?
4. 6 times 9 and 8?
5. What is the remainder, after taking 68 from 75?
6. 57 from 63?
7. $.05 from $.81?
8. 3 times 3 from 100?
9. A tree 65 feet high was broken off 8 feet from the ground. What was the length of the part broken off?

The length of the part broken off was the difference between 65 feet and 8 feet, which is 57 feet.

10. If the price of a sofa is $32 and of a bureau $25, what is the difference in the prices?
11. A drover having 41 horses sold 8 of them. How many horses had he left?
12. From a piece of carpeting 61 yards long, a merchant sold 52 yards. What was the length of the remnant?

2. 1. From 26 pounds take 16 pounds + 8 pounds.
2. From 85 trees take 10 × 7 trees.
3. From 1 dollar take 5 dimes + 8 half-dimes.
4. From 8 gallons (32 quarts) take 6 gallons 3 quarts.
5. Subtract 60 dollars from 8 × 9 dollars.
6. Subtract 7 rods from 35 rods + 9 rods.
7. Subtract 9 days from 50 days + 20 days.
8. Subtract 47 pecks from 7 × 8 pecks.
9. Subtract 7 gallons 3 quarts from 10 gallons.

How many are left

10. After selling 87 barrels from 94 barrels?
11. After taking 60 bags from 7 times 10 bags?
12. If I give 30 pears and 40 pears from 95 pears?
13. If you use 8 times 6 bushels from 56 bushels?
14. If we take 72 tons from 9 times 9 tons?

3. 1. 10 times 9 are how many more than 80?

2. 50=14+10+3+8+how many?

3. 9 times $6−7 times $7 are how many dollars?

4. 4 times 9 equals 2 times 5, and 7 times 4, and how many?

5. From 75 bushels of wheat a farmer sold 56 bushels, and sowed 10 bushels. How many bushels remained?

6. What is the difference in the cost of 2 cutters at $30 apiece, and 6 saddles at $10 apiece?

4. In subtracting numbers, *take ones from ones, tens from tens, hundreds from hundreds*, and so on.

For convenience in subtracting, *write the less number under the greater, placing ones under ones, tens under tens*, and so on.

	1	2	3	4	5
From	47	362	4,187	$8,600	$83.50
Take	21	130	1,082	3,200	31.20
Remainder,					

6. From 875 take 372.

7. From 2,739 take 2,135.

8. Take 23,170 from 56,397.

9. 754,365−231,043=

10	11	12	13	14	15	16	17	18
15	35	13	43	106	117	147	1,586	12,769
8	8	9	9	46	35	62	832	9,350

5. Example.—Subtract 35 from 82.

Explanation.—*1st.* I write the subtrahend under the minuend, placing ones under ones and tens under tens, and draw a line below the subtrahend.

2d. Since the 5 ones of the subtrahend is more than the 2 ones of the minuend, I take 1 ten from the 8 tens of the minuend, and, *adding it to the 2* ones, I have 12 ones. I now take 5 ones from 12 *ones, and write the 7* ones remaining as the ones of the result.

3*d*. Since I have used 1 of the 8 tens of the minuend, I take 3 tens from 7 tens, and write the 4 tens remaining as the tens of the result. The entire result, 47, is the remainder required.

Exercises combining written and oral work.

1	2	8	9
		2 9 10	9 9 10
54	$37.20	3 0 0	1, 0 0 0
19	14.50	5 7	9

3. 93 minus 37.
4. 547 minus 192.
5. $854 minus $319.
6. 8,547 less 3,192.
7. 4,695 less 2,875.
10. From 2,146 take 1,859.
11. From 7,352 take 2,634.
12. Take $7.48 from $42.37.
13. Take $270.73 from $351.65.
14. 500−31.
15. 100−3.
16. $21.00−$3.25.
17. 3,000−40.
18. 40,000−205.

6. 1. How many are 1,503 soldiers, less 807 soldiers?

2. 3,174 sheep−1,085 sheep?
3. 9,812 tons less 7,923 tons?
4. 2 × $41.82 less $56.91?
5. $287.50−$96.75?
6. $6,132−3 times $975.31?
7. 31,784 feet−20,395 feet?
8. 130,500 yards − 85,007 yards?

9. If Peter had 35 cents more, he would have 100 dollars. How much money has he?

10. A newspaper has 9,275 subscribers, 7,090 of whom live in the city. How many live in the country?

11. In a certain city are 24,375 children of school age, and 15,948 attend school. How many do not attend school?

12. A builder took a job for $372. He employed 10 men 3 weeks at $2 a day. How much did he make?

13. A man owning 840 acres of land, bought 578 acres, and then sold 932 acres. How many acres had he left?

14. A merchant borrowed 3 50-dollar bills, 7 20-dollar bills, 8 5-dollar bills, and 3 1-dollar bills. After paying $237.25, how much did he owe?

DIVISION

1. The number found by dividing, is called the *quotient.*

What is the quotient of
1. 56 divided by 7?
2. 54 divided by 9?
3. 81÷3 times 3?

How many times are
4. $4 contained in $32?
5. $.09 contained in $.72?
6. 5 posts contained in 35 posts?

7. A tea-merchant put up 36 pounds of tea in 4-pound packages. How many packages had he?

He had as many packages as the times 4 pounds are contained in 36 pounds, which is 9 times.

8 quarts are a peck; 4 pecks are a bushel.

How many pecks
8. Are 24 quarts?
9. Are 56 quarts?
10. Are 44 quarts?
11. Are 75 quarts?

How many bushels
12. Are 40 pecks?
13. Are 32 pecks?
14. Are 27 pecks?
15. Are 75 quarts?

2. How much is

1. 1 half of 60 brooms?
2. 1 eighth of 64 tickets?
3. 1 third of 24 brushes?
4. 1 tenth of 90 buckets?

5. In an orchard are 45 trees in 5 equal rows. How many trees are in one row?

In one row there are 1 fifth as many trees as there are in 5 rows; and 1 fifth of 45 trees is 9 trees.

6. Twenty-eight panes of glass are in the seven front windows of a house. How many panes are in one window?

7. A cooper used 60 staves for 3 tubs. How many staves did he use for 1 tub?

8. If 42 yards of carpeting are cut into 6 equal breadths, how many yards will there be in each breadth?

9. A man bought a cow for $42, and paid for her in 6 *equal monthly* payments. How much was each payment?

10. A bookseller having 28 geographies, sold 1 fourth of them. How many did he sell? How many had he left?

11. If 7 barrels of apples cost $21, how much will 1 barrel cost? How much will 11 barrels cost?

12. If 5 bushels of charcoal cost 50 cents, how much will 9 bushels cost?

3. With 32 quarts of milk, how many times can you fill

1. An 8-quart pail?	3. A 6-quart pan?
2. A gallon jug?	4. A 3-gallon jar?

How much salt will be in each sack, if you put

5. 40 quarts into 5 sacks?	7. 1 bushel into 8 sacks?
6. 54 quarts into 9 sacks?	8. 3 pecks 6 quarts into 6 sacks?

9. With 56 rails, how many lengths of 7-rail fence can be built? How many lengths of 8-rail fence?

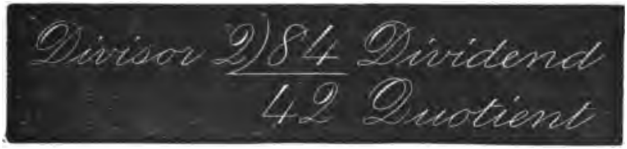
10. If 3 bars of soap cost $.24, how much will 5 bars cost?

11. If you divide 36 marbles equally among 6 boys, how many marbles will 2 boys have?

12. If you pick 3 pecks of berries in a day, and I pick 2 pecks, in how many days will we pick 10 bushels?

13. A blacksmith collected $15, $20, $9, $7, and $5, and with the money bought coal at $6 a ton. How many tons of coal did he buy?

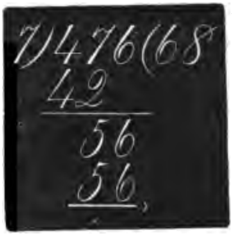
4. 1. EXAMPLE.—What is the quotient of 84 divided by 2?



2	3	4	5	6
3)69	2)846	3)963	4)4,884	3)12,360

Divide			
	7. 1,050 by 5.	9. 2,139 by 3.	11. 184,602 by 2.
	8. 1,869 by 3.	10. 16,480 by 4.	12. 14,077 by 7.

5. **Example.**—Divide 476 by 7.



Explanation.—*1st.* I write the divisor at the left of the dividend, with a line between them, and another line on the right of the dividend.

2d. Dividing 47 by 7, I write 6—the result—for the first quotient figure. Multiplying 7—the divisor—by this 6, I obtain 42—the part of the 47 divided—and write it under the 47. Subtracting, I obtain 5, the part of the 47 undivided. To this remainder I annex the 6 of the given dividend, making 56 for a new dividend.

3d. Dividing 56 by 7, I write 8—the result—for the second quotient figure. Multiplying the divisor by this 8, I obtain 56, and write it under the 56 divided. Since there is no remainder, the entire result, 68, is the quotient required.

Divide	Find the quotient	How much is
1. 288 by 3.	5. $968÷4.	9. 1 eighth of 3,296?
2. 966 by 6.	6. $10.48÷3.	10. 1 fourth of 7,284?
3. 1,084 by 4.	7. $250.44÷6.	11. 1 fifth of 17,565?
4. 1,255 by 5.	8. 640,955÷7.	12. 1 ninth of 74,628?

6. **Example.**—What is the quotient of 476 divided by 7?

In the written process given above, all the numbers used are written. In the written process here given, only the divisor, dividend, and quotient are written.

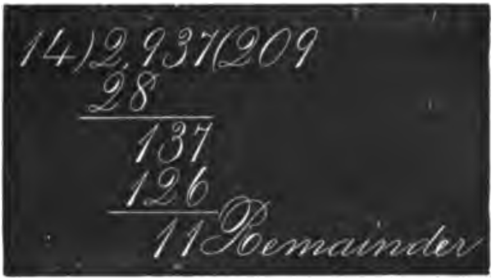
When all the products and partial dividends are written, the process is called **long division.**

When only the divisor, dividend, and quotient are written, the process is called **short division.**

Divide, by both long and short division,

13. 1,728 by 6. By 8. By 9.
14. 1,944 by 3. By 4. By 9.
15. 2,940 by 5. By 3. By 7.
16. 61,920 by 8. By 5. By 10.
17. 780,000 by 5. By 8. By 4.
18. 401,400 by 9. By 6. By 10.

7. Example.—What is the quotient of 2,937 divided by 14?



Divide

1. 9,885 by 8.
2. 75,132 by 25.
3. 33,542 by 17.
4. 5,487 by 31.
5. 318 by 48.
6. 526 by 43.
7. 3,750 by 30.
8. 9,478 by 60.
9. 356 by 40.
10. 18,725 by 90.
11. 131,646 by 12.
12. $63,378 by 63.
13. $610,970 by 15.
14. $299,386 by 24.
15. $47.25 by 45.
16. $20 by 8.
17. $99 by 36.
18. 318,580 by 52.

8. 1. 6,584 quarts are how many gallons?

2. 6,409 days are how many weeks?

3. 44,539 quarts are how many pecks? How many bushels?

4. A man bought a store for $6,875, and paid for it in 5 equal yearly payments. How much did he pay each year?

5. One year a stable keeper paid $6,832 for hay, at $16 a ton. How many tons did he buy?

6. A planter picked 6,555 pounds of cotton from 15 acres. How many pounds was that to an acre?

7. If a steamship runs 2,870 miles in 14 days, how many miles does she run in one day?

8. How many barrels, holding 40 gallons each, can be filled from 494 gallons of cider?

9. A farmer exchanged his crop of 25 acres of corn for 30 cows, giving 38 bushels of corn for a cow. How many bushels of corn did he raise to an acre?

10. A fruiterer put 22,750 bushels of peaches into boxes holding 3 pecks each, and shipped them in 72 cars. How many boxes was that to a car?

REVIEW

A. 1. What will be the cost of 8 brooms at $.30 apiece?

2. Of 6 dining-tables at $7 apiece?

3. Of 4 lamps at $2 apiece, and 6 vases at $7 a pair?

4. From 48 take 7 times 6, multiply by 2 times 5, add 2 times 20, subtract 5 times 6, divide by 1 fifth of 35, multiply by 15 less 8, add 1 half of 4, and divide by 10 less 1.

5. 12÷2, plus 14÷2, plus 16÷2, plus 18÷2 = how many?

6. How much is 3 times 1 seventh of 42 pieces of ribbon?

7. 5 times 1 eighth of 72 boxes of raisins?

8. 4 times 1 fifth of 100 yards of carpeting?

9. From 47 take 3 times 3, and how many times 5 remain?

10. 1 eighth of 80, +1 fifth of 25, ÷1 fourth of 12, × 3 times 3 = how many times 7?

11. 8×4+3, −7×2−3 = how many times 8?

12. 45 cents are how many half-dimes?

13. After buying 5 pounds of sugar at $.09 a pound, 3 pounds of rice at $.05 a pound, and 1 pound of starch for $.15, I had $.25 left. How much money had I at first?

14. How many acres of meadow can be seeded with 1 bushel 1 peck of grass-seed, at 5 quarts to the acre?

15. 1 third of 21, 1 fourth of 32, and 1 seventh of 35, from 5 times 10 leaves how many times 6?

16. How many days' work of 8 hours each are equal to 9 days of 10 hours each?

17. At 90 cents for 10 pounds of grapes, how many pounds can be bought for 63 cents?

18. 8 acres is 1 seventh of my farm. Of how many acres does my farm consist?

19. 8 7's − 4 4's, ÷ 4 2's + 7 9's are how many 7's?

20. $1.25 is 1 fourth of how much money?

21. Eugene gathered 80 quarts of chestnuts. He gave his brother 6 quarts, kept 10 quarts, and sold the remainder. How many bushels did he sell?

22. 24 fruit-trees are how many rows of 6 trees each? How many rows of 8 trees each?

23. Divide 16 by 1 half of 4, add 1 third of 24, subtract 1 third of 12, divide by 1 fourth of 8, multiply by 1 sixth of 54, subtract 1 seventh of 63, and divide by 1 fifth of 45?

24. A hotel keeper bought 9 boxes of strawberries of one person, and 7 boxes of another: 2 boxes were used at dinner, and 5 boxes at tea. How many boxes were left?

25. Emily having $.16, spent $.03 for an orange, and $.05 for a bunch of grapes. Had she more or less money left than she had spent, and how much?

26. On a journey of 3 days my expenses were $5, $7, and $6. When I started I had a 10-dollar bill, 3 5-dollar bills, 2 2-dollar bills, and $1 in silver. How much money had I when I returned?

B. 1. Add eight hundred seventy-six thousand one hundred twenty, three hundred ninety-six thousand four hundred ninety-one, and five hundred fifty-three thousand six hundred seven.

2. What is the sum of 90,070 feet, 8,750 feet, 975 feet, 7,658 feet, 76,508 feet, 6,089 feet, and 789,456 feet?

3. July has 31 days, August 31, September 30, October 31, November 30, and December 31. How many days have the 6 months?

4. Washington was born in 1732. What was his age when he became President of the United States, in 1789?

5. 24 hours are 1 day. 17,136 hours are how many days?

6. I sold 45 barrels of flour at $6 a barrel, and 72 barrels at $7 a barrel. How much did the sales amount to?

7. What is the product of three hundred seventeen times *four hundred* thousand six hundred nine?

8. The multiplicand is 75,321 pounds, and the multiplier is 750. What is the product?

9. A mile is 5,280 feet. How many feet are 36 miles?

10. A common clock strikes 156 times every day. How many times does it strike in the month of October?

11. If an ocean steamer runs 3,750 miles in 15 days, how many miles does she run in 9 days?

12. From seven hundred fifty-two thousand three hundred eighty-one subtract forty-five thousand forty-seven.

13. What is the difference between $205,840 and $90,065?

14. If 1 pound of wool is used in making 9 hats, how many pounds will be used in making 144 hats?

15. How many hats can be made from 25 pounds of wool?

16. How many hills of corn are there in a field of 52 rows of 147 hills each?

17. What is the quotient of fifty-one thousand three hundred twenty-seven divided by twenty-seven?

18. The divisor is 57, and the dividend is 73,654 yards. What is the remainder?

19. I bought 15 bushels of salt at $.62 a bushel, and sold it at $.19 a peck. How much did I gain?

20. One man earns $43.75 a month, and another man $37.50. How much do the 2 men earn in 1 year, or 12 months?

21. A merchant bought 10 stoves at $16 apiece. He sold all but 3 of them at $21.50 apiece. Did he receive more or less money than he paid out, and how much?

22. Multiply 3 by 2, the product by 2, the second product by 2, and so on, till you have multiplied 15 times by 2. What is the last product?

SUGGESTIONS TO TEACHERS

Accuracy and Rapidity.—In arithmetical computations accuracy is essential to success in business. Rapidity in computations, though not necessary to success, is yet an acquirement of great value in business life.

The ability to compute accurately and rapidly may be acquired by nearly all boys and girls, by proper training, without neglect of other school work. To aid teachers in this important work is the object of the following suggestions:

I. The Combinations.—All possible combinations of integers are comprehended in 45 sets or *scales*, as follows: 1 scale composed of one hundred 1's; 2 scales of 2's—one of fifty 2's, and one of one 1 and fifty 2's; 3 scales of 3's—one of thirty-four 3's, one of one 1 and thirty-three 3's, and one of one 2 and thirty-three 3's; and so on, through 9 scales of 9's. A clear idea of all the scales, as well as the manner of writing them for class drill, may be obtained from the examples here given.

The sum of each complete scale is 100, or the next sum in the series above 100.

For the purpose of drill in addition on the scales of the smaller numbers (1, 2, 3, and 4), write on the board any number of figures convenient, in a column, as here shown, and in using them, when the end of the column is reached, return instantly to the foot or top of the column, and continue the drill till the limit of the *scale is reached*. Drill pupils in adding columns both up and down.

FOR DRILL IN ADDITION.

etc.	etc.	1	etc.	etc.	1	2	2
		2			3	3	3
1	2	2	2	3	3	3	1
1	2	2	1	3	3	3	2
1	2	2	2	3	3	3	3
1	2	2	1	3	3	3	1
1	2	2	2	3	3	3	3
1	2	2	1	3	3	3	2
1	2	2	2	3	3	3	3
1	2	2	1	3	3	3	2
1	2	2	2	3	3	3	3
1	2	2	1	3	3	3	1
1	2	2	2	3	3	3	2
1	2	2	1	3	3	3	3
1	2	2	2	3	3	3	2
1	2	2	1	3	3	3	1
1	2	2	2	3	3	3	2
1	2	2	1	3	3	3	3
1	2	2	2	3	3	3	2
1	2	2	1	3	3	3	1
1	2	2	2	3	3	3	3
1	2	2	1	3	3	3	2
1	2	2	2	3	3	3	1
1	2	1	1	3	1	2	3

In adding upward, begin with the number below the lower rule-line; in adding downward, begin with the number above the upper rule-line.

The columns of 1's, 2's, 3's, and so on, with the numbers above and below the rule-lines, form the scales in series; and the other columns (composed of numbers not in series) are for reviews. Drill pupils on each scale in series, and on each review column, till they add 1st, accurately, and, 2d, *rapidly.*

FOR DRILL IN MULTIPLICATION.

In series.	1	2	3	4	5	6	7	8	9
									3
For review.	7	4	1	8	5	2	9	6	3
									3

FOR DRILL IN SUBTRACTION.

In series.	2	3	4	5	6	7	8	9
	2	2	2	2	2	2	2	2
For review.	5	8	4	7	3	6	9	2
	2	2	2	2	2	2	2	2

FOR DRILL IN DIVISON.

In series.	2)	2	4	6	8	10	12	14	16	18
For review.	2)	10	2	12	4	16	6	14	8	18

II. Oral and Written Work.—Be sure that the pupil *sees* the number he is using *at the instant he uses it.* Unless he sees and uses the number simultaneously, he does not receive the full value of the drill.

In the drill upon any scale, proceed as follows:

1. Class compute orally, in concert.
2. Each pupil compute orally; class observe, and detect errors.
3. Class in concert compute silently, and name final result, teacher or pupil pointing to the numbers.
4. Class compute silently, each in his best time.

III. Length of Time for Class Drills.—At least 10 minutes daily for one full school year should be occupied with these drills. Two exercises daily, of 10 minutes each, for two full school years, will be of as much *practical value to pupils,* as any other use that can be made of the time. The *drill should not* be continued more than 10 minutes at any one time.

IV Grading the Work.—The work outlined below may be gone over, with great profit to pupils, in one school year. But, to secure the most desirable results, two full school years should be given to it.

1. WORK IN ADDITION.

a. Drills in the 45 scales of the numbers 1—9; and reviews.

b. Add two, three, four, or any desired number of columns.

2. WORK IN MULTIPLICATION.

a. After drill in adding 2's is completed, multiply by 2 from 2×1 to 2×9 inclusive; and review.

b. Use multiplier expressed by two, three, or more figures, composed of 1's and 2's only.

c. Follow addition of 3's by multiplying by 3 (as in *a* and *b*); and so on of 4, 5, 6, etc.

3. WORK IN SUBTRACTION.

a. After adding 2's and multiplying by 2, subtract 2 from 2, 3, 4, . . . to 12 inclusive, in series; and then review.

b. Subtract numbers expressed by 1's and 2's from any number expressed by the same number of figures each greater than 2.

c. Follow addition and multiplication of 3's by subtracting 3 (as in *a* and *b*); and so on of 4, 5, etc.

4. WORK IN DIVISION.

Work to begin after adding, multiplying, and subtracting 2's.

a. Divide the first nine multiples of 2 (2, 4, 6, 8, etc.) by 2, in series; and then review.

b. Divide the natural series of numbers 2, 3, 4, . . . to 18 inclusive, by 2 and give the *1 over*, or 1 remainder, where it occurs; and review.

c. Follow the addition, multiplication, and subtraction of 3's by dividing by 3 (as in *a* and *b*); and so on, of 4, 5, etc.

Divisors expressed by more than one figure may be introduced, at the discretion of the teacher. But it is commonly better to confine the work to short division till all the scales of combinations have been mastered.

V. Timing the Work.—The interest of pupils in these drills may be greatly increased, by frequently permitting them to perform the review exercises in a given time. Great care should be taken to time the work by the ability of the *slow* pupils to perform it; the quick pupils will take care of themselves.

MILLIONS

I. *Ten hundred-thousands* are *one million.*

One million is expressed by figures thus: 1,000,000

1. Express by figures two million, 2,000,000
2. Three million.
3. Four million.
4. Six million.
5. Seven million.
6. Eight million.
7. Nine million.

II. *Ten millions* are *one ten-million.*

1. Express by figures ten million, 10,000,000
2. Twenty million.
3. Thirty million.
4. Forty million.
5. Fifty million.
6. Eighty million.
7. Ninety million.

III. *Ten ten-millions* are *one hundred-million.*

1. Express by figures one hundred million, 100,000,000
2. Three hundred-million.
3. Five hundred-million.
4. Six hundred-million.
5. Eight hundred-million.

IV. **a.** How many figures are required

1. To express millions?
2. To express ten-millions?
3. To express hundred-millions?

Name a number

4. Expressed by seven figures.
5. Expressed by eight figures.
6. Expressed by nine figures.

b. 1. What numbers are expressed by one period of figures?
2. What numbers are expressed by two periods of figures?
3. What numbers are expressed by three periods of figures?

c. Write in words and read

1. 3,000,300
2. 25,500,000
3. 317,080,000
4. 804,600,200
5. 182,003,060
6. 123,456,789

V. **a.** What is the smallest number that you can express

1. By one figure?
2. *By two figures?*
3. *By three figures?*
4. By four figures?
5. By five figures?
6. By six figures?
7. By seven figures?
8. By eight figures?
9. By nine figures?

b. What is the largest number that you can express

1. By one figure?
2. By two figures?
3. By three figures?
4. By four figures?
5. By five figures?
6. By six figures?
7. By seven figures?
8. By eight figures?
9. By nine figures?

VI. a. Copy and read

1. 7,650,738
2. 3,031,504
3. 1,904,003
4. 60,440,012
5. 37,090,040
6. 45,000,000
7. 300,003,030
8. 860,210,370
9. 7,400,000
10. 374,508,294
11. 34,324,586
12. 4,000,800
13. 695,400,300
14. 12,065,587
15. 940,050,849

b. Write in periods, and read

1. 650200070
2. 3050300
3. 85700025
4. 506427711
5. 1702050
6. 34000906
7. 13006400
8. 6000030
9. 197652843

VII. Express these numbers by figures:

1. One million three hundred six.
2. Three million two thousand forty.
3. Seven million fifty thousand four hundred.
4. Four million two hundred fifty-nine.
5. Nine million two hundred two thousand eleven.
6. Ten million twenty-five thousand four hundred.
7. Forty million eighty thousand two hundred seventy-six.
8. Twelve million six hundred fifty-one thousand five hundred eighty-seven.
9. Seventy-nine million four hundred six thousand.
10. Sixteen million nine thousand five.
11. Three hundred million three hundred thousand three hundred three.
12. Nine hundred million six hundred thousand.
13. Five hundred twenty-four million.
14. Six hundred nineteen million thirty.
15. Five hundred nine million six hundred twelve thousand seven hundred eighty-five.

ADDITION

1. Add

1	2	3	4
6,082	28,291	50,076	129,341
2,765	41,728	4,821	327,393
8,461	19,561	3,754	482,384
2,686	69,148	33,292	30,698
3,722	32,695	652	27,503
4,963	57,751	777	585,654
9,742	83,918	14,193	7,973,900
5,293	79,148	24,000	3,257,168
1,508	30,684	76,748	8,031,004
7,454	57,293	6,009	5,350,270

Add

5	6	7	8
$59,463	$ 240.05	$13,295	$17,488,230.69
20,007	309.52	52,317.25	73,691,215.75
15,060	1,000.87	40,503.96	887,903.12
3,645	593.10	8,572.21	40,645.37
9,327	604.33	6,217	3,608,005.21
93,682	512.40	38,054	4,712
47,321	7,895.16	62,100.50	630.92
964	2,018.35	17,682.19	95,123.46
736	3,010.92	573.68	5,006,007.08
16,419	8,650.71	80,808.08	26,320,091
84,567	81.59	4,396.37	9,417,030.08
15,230	235.90	7,108	80,421.75
7,906	367.44	4,170.87	7,905.88
372	76.15	69,403.02	940,000
28,016	8.62	85,004.70	12,087,406.21
69	529.07	612.28	92,920,058.13

2. 1. Find the sum of 20,200; 16,395; 9,326; 333,330; 404,040; and 89,517.

2. Of 386,795; 1,000,500; 48,906; 30,277; and 854,688.

3. Of 1,308,250; 9,876,543; 86,210,789; 508,967,482; 25,000,025; 899,465,090; 48,540; and 360,204,517.

4. Add $437.25; $995; $7,350.48; $728.28; $5,059.71; $2,400; $7,530.06; $176.80; $5,192.83; and $7,460.19.

5. Find the sum of $90,364.25; $400,375; $81,250.16; $29,843.56; $397,889.65; $503,040; and $101,055.82.

6. Find the sum of thirty-eight thousand one hundred twenty, sixteen million seven hundred eighty-five thousand, seventy-two thousand nineteen, and five million sixty-four thousand two hundred nine.

7. Add 125 million 821 thousand 250, 6 million 508 thousand 712, 18 million 77 thousand 14 600 million 48, and 1 million 8 thousand 970.

3. 1. 523 feet + 712 feet + 245 feet + 3,905 feet + 4,803 feet + 7,400 feet + 12,186 feet are how many feet?

2. One season a buyer shipped 395 barrels, 827 barrels, 1,416 barrels, 902 barrels, 731 barrels, 2,086 barrels, and 3,564 barrels of apples to New York. How many barrels did he ship?

3. At an Illinois coal-mine 11 trains were loaded with coal, as follows: 728 tons, 532 tons, 619 tons, 805 tons, 716 tons, 927 tons, 681 tons, 638 tons, 762 tons, 879 tons, and 598 tons. How many tons were on the 11 trains?

4. A manufacturer made 1,465,267 yards of cotton goods in the year 1879, 1,532,492 yards in 1880, 971,654 yards in 1881, and 1,632,705 yards in 1882. How many yards did he make in the four years?

5. On a journey I paid $29.33 railroad fare, $15.50 steamboat fare, $27.25 hotel bills, and $18.32 for other expenses. How much were my expenses for the journey?

MULTIPLICATION

	1	2	3	4
1. Multiply	38,768	480,709	1,555,677	51,304
by	97	493	56	208

5	6	7	8
4,308,762 inches	90,876 words	85,308 hats	2,089 books
408	532	37	1,175

9	10	11	12	13
$130.75	$84,005	$3.33	$3,952.17	$267.53
374	45	893	7,064	31,928

14	15	16	17
9,872	9,985	45,300	81,100
600	24,000	8	410

2. Multiply

1. 32,098 by 18.
2. 100,300 by 10; by 100.
3. 37,086 by 58; by 275.
4. 194,207 by 400.
5. 6,118,317 by 29.
6. 4,687,762 by 10; by 60.
7. 7,000,215 by 57.
8. 61,948 by 200.
9. 413,687 by 638.

How much is

10. 45 times 13,019 yards?
11. 86 times 2,243 tons?
12. 250 times $1,183?
13. 99,876 × 996?
14. 4,888 × 500?
15. 85,967 × 1,000?
16. 1,593 × 4,000?
17. 764,000 × 188?
18. 2,876 × 1,002?

3. Complete the following:

1. 39 times 2,100 pens =
2. 860 times 350 plants =
3. 979 times 3,672 sheep =
4. 7,000 times 7,000 men =
5. $93.50 × 15 =
6. $650 × 200 =
7. $86,013 × 876 =
8. $5,137.10 × 49 =

9. Multiply 5 million 26 thousand 4 hundred by 2 thousand 5 hundred.

10. The multiplicand is 95,025, and the multiplier is 297. What is the product?

11. Multiply six hundred seventy thousand twenty-four by three hundred eight.

4. Find the cost of
1. 72,185 pounds of honey, at 35¢ a pound.
2. 15,390 quarts of berries, at 25¢ a quart.
3. 2,860 dozen buttons, at 34¢ a dozen.
4. 24,768 yards of ribbon, at 9¢ a yard.
5. 38,136 pairs of boots, at $4.75 a pair.
6. 2,875 mules, at $153 apiece.
7. 1,263 horses, at $115 each.
8. 58,619 oranges, at 3¢ apiece.
9. 274,185 gallons of kerosene, at 23¢ a gallon.
10. 518 acres of land, at $112.50 an acre.
11. 25 locomotives, at $18,725 each.
12. 71,250 pounds of prunes, at 8¢ a pound.
13. 7,500 bushels of potatoes, at 82¢ a bushel.

14. How much will it cost to build a railroad 475 miles long, at $33,500 per mile?

15. How much is the yearly pay of an army of 750,000 men, at $196 per man?

16. A miller bought 9 loads of barrels, each load containing 146 barrels, at 31¢ each. How much did they cost him?

17. What is the weight of 750 bales of hay, each bale weighing 280 pounds?

18. In 15 days 6 men lay the walls of a house, laying 5,685 bricks each day. How many bricks are in the walls?

19. At a factory 280 pumps are made each working-day. How many pumps are made in 312 working-days?

20. If your pulse beats 3,900 times in an hour, how many times will it beat in a day or 24 hours? How many times in a week? How many times in this month?

SUBTRACTION

1.

	1	2	3	4
From	846,200	3,968,042	73,864,210	30,698,746
Take	109,273	1,087,354	588,937	8,269,307

	5	6	7
From	4,960,592 crayons	27,000,000 nails	400,375,219 pins
Take	86,247 crayons	937,084 nails	251,076,054 pins

	8	9	10	11
From	$597,640.96	$87,525.32	$2,333,010.00	$10,000,000
Take	39,854.24	3,497	.86	937.54

2. Subtract

1. 497,600 from 850,000.
2. 864,597 from 978,654.
3. 3,978 from 4,080,604.
4. 45,283 from 80,090,070.
5. 90,708,443 from 200,007,321.

How much is

6. $35,553—$14,449?
7. $1,901.05—$774.86?
8. $968.00—$552.23?
9. $4,150,306—$1,005,471?
10. $623,955.10—$87,166.75?

11. Find the difference between twenty-seven million sixty-three thousand one hundred forty-eight and five million eighty-four thousand three hundred seventy-five.

12. Take four hundred thousand seven hundred eight from nine hundred million nine thousand.

13. Subtract 5 million 208 thousand 37 from 61 million 40 thousand 696.

14. The minuend is 16 million 4 thousand 3 hundred, and the subtrahend is 9 million 90 thousand 99. What is the remainder?

15. Subtract $270,312.45 from $1,000,000.

3. 1. A farmer has 46,250 pounds of hay, and 32,175 pounds of straw. How much more hay than straw has he?

2. Last year a Florida orange grove produced 672,319 oranges, 84,290 of which were sour. How many were sweet?

3. The live weight of 60,000 fat cattle was 53,280,738 pounds, and the shrinkage was 15,223,068 pounds. What was the dressed weight?

4. A sugar refinery produced 7,110,040 pounds of white sugar from 9,090,621 pounds of raw sugar. How many pounds less were produced than were used?

5. A planter's sugar crop is 3,962,283 pounds, and he sells 1,853,775 pounds. How many pounds has he remaining?

6. In the year 1880 Michigan produced 12,425,885 bushels of salt, and New York produced 8,748,203 bushels. How much more did Michigan produce than New York?

7. A drover bought cattle for $26,574, and sold them for $35,896. How much did he gain?

8. A merchant buys goods to the amount of $13,762.19, and pays $5,231.25 cash. How much does he buy on credit?

9. The receipts of a railroad are $17,269,841.57, and the expenses are $11,417,293.21. How much do the receipts exceed the expenses?

10. A Saratoga hotel that cost $217,585 was sold for $186,750. For how much less than cost was it sold?

11. A factory worth $500,000, and insured for $318,750, was burned. How much did the owners lose?

12. The area of Texas is 274,000 square miles, and of New England 65,300 square miles. How much larger than New England is Texas?

13. The earth is 95,000,000 miles from the sun, and the moon is 240,000 miles from the earth. How much farther is the earth from the sun than from the moon?

DIVISION

1.

1. 9)417,655
2. 8)10,683,744
3. 12)3,678,428(
4. 48)123,456,768(
5. 365)49,740(
6. 999)340,573,129(
7. 32)$880,960(
8. 5)$7,020.60
9. 87)$4,280.91(

2. Divide

1. 1,786,950 by 96.
2. 37,844,000 by 9; by 11.
3. 126,378 by 63.
4. $375.50 by 25.
5. $29,763.45 by 5.
6. $70 by 125.

What is the quotient

7. Of 9,080,000÷400?
8. Of 57,476,045÷55?
9. Of 780,000 bags÷13?
10. Of 8,378,550 pounds÷9?
11. Of 570,000 tons÷625?
12. Of 742,619,856 seconds÷8?

13. Divide one hundred fifty-three million eight thousand by four hundred seventeen. What is the remainder?

14. Divide two million twenty thousand five hundred by five hundred.

15. Find the quotient of seven hundred million seven hundred thousand seven hundred divided by seven hundred.

3. 1. If 30 workmen lay 3,396,000 bricks in 100 days, how many bricks do they lay in 1 day? How many bricks does 1 man lay in 1 day?

2. In how many days can 56 men do 24,640 days' work?

3. At a carpet factory 30,550 yards of carpeting are made in 113 days. How many yards are made in a day?

4. 60 pounds of wheat are a bushel, 6,720,000 pounds are how many bushels?

5. A railroad conductor made 4 trips each week, and traveled 61,568 miles in a year or 52 weeks. How many miles did he travel in a week? How many miles at a trip?

6. A house painter earned $3,066 in 5 years. How much did he earn in a year? How much in a month?

7. A dealer paid $1,606.50 for 225 barrels of kerosene, each barrel holding 42 gallons. How much did he pay for a barrel? How much for a gallon?

8. $843.90 for 870 bushels of potatoes is how much for a bushel?

9. A planter sold his crop of 560 casks of rice for $23,133.60. How much was that for 1 cask?

10. A New York daily newspaper publisher uses 30,048,000 sheets of paper in a year. How many quires of 24 sheets each does he use? How many reams of 20 quires each? How many bales of 10 reams each?

11. A wheat buyer shipped 304,500 bushels of wheat in 87 cars. How many bushels did he ship in each car?

12. If a railroad train runs 240,384 miles in 626 days, how many miles does it run in 1 day?

13. If it runs 12 hours a day, how many miles does it run in an hour?

14. A market gardener received $517.53 for lettuce, at 7 cents a head. How many heads of lettuce did he sell?

15. 177,760 quarts of oats are how many bushels, there being 32 quarts in a bushel?

16. At a shoe factory 648,000 pairs of shoes were made in 300 days. How many pairs were made daily?

17. A railroad company paid $68,450 for 37 coaches. How much was that for each coach?

18. A drover bought 868 cattle for $15,624: 124 of the cattle died, and he sold the remainder for the same sum that he paid for the whole. What did they cost per head?

REVIEW

1. How many are

1. 24 × 36 + 500?
2. 3,154 + 54 × 78?
3. 26 × 305 + 42 × 950?
4. 3,160 + 14,508 + 7 × 25,040?
5. 7 × $295 + $168.13 + $2,036.94?
6. $358 × 13 + $12,179?
7. 5 times $419.50, plus $946.38?
8. 12 × $3,126 + 37 × $8,904?

9. Multiply five million two hundred twenty-seven thousand by seventeen, and to the product add four million four thousand four.

10. What is the sum of sixty-three thousand five hundred fifty-five and three hundred times twenty thousand ten?

11. Multiply 10 thousand 137 by the sum of 5 hundred 4 and 2 hundred 53.

2. 1. Find the cost of 5 pieces of cambric of 43 yards each, at 35¢ a yard.

2. A grocer bought 3 barrels of sugar weighing 236 pounds, 261 pounds, and 249 pounds, at 9¢ a pound. What was the amount of the purchase?

3. A wood dealer sold 236 cords of oak, at $6 a cord; 675 cords of maple, at $5; and 439 cords of pine, at $4. How much did the sales amount to?

4. A woman bought 12 yards of delaine, at 20¢; 16 yards of muslin, at 12¢; and a shawl for $9.50. How much did her purchases amount to?

5. A provision dealer bought 862 barrels of pork, at $17 a barrel; and sold the lot for $696 more than it cost him. How much did he receive for it?

6. In a certain church are 78 pews, 26 of which rent for $52 each, 22 for $39 each, and the others for $26 each What are the receipts from pew rents?

7. What is the total cost of 38 head of cattle, at \$27; 92 head, at \$30; and 17 head, at \$35?

8. Ezra has 85 cents, Thomas has twice as many, and Horace has 75 more than both of the other boys. How many cents have the three boys?

9. In 9 bales of cloth, each bale containing 25 pieces, and each piece 54 yards, are how many yards?

10. Find the cost of 8 horses, at \$187.50 each; 4 carriages, at \$325 each; and 4 sets of harness, at \$56.25 a set.

3. 1. 80,000+2,751−11,919.
2. 9,500,002−52,096+130,715.
3. 404,987− 3,021,− 43,902.
4. 7,065,432+16,086−147,059.
5. \$177.55−\$31.88+\$416.10.
6. \$8,295+\$3,674−\$836.59.
7. \$70,100−\$32,069.08+\$8,150.32.
8. \$4,030,209−\$890,000,−\$64,961.

9. From the sum of five thousand three hundred seventy-five, ninety thousand fifty-four, and eight hundred thousand sixty, take seventy thousand two hundred seven.

10. Subtract two thousand three hundred nine from the sum of six hundred seventy thousand, fifty-nine thousand, and eighty-eight thousand eight.

11. To 18 thousand 320 add 4 million 778 thousand 6, and 48 thousand 499; and from the sum subtract 105 thousand 80.

4. 1. In three months the running expenses of a factory were as follows: for stock, \$31,587, \$26,319.50, and \$28,043.78; for wages, \$7,594.18, \$6,852.47, and \$7,329.50; and for other expenses, \$932, \$1,084.10, and \$837.54. How much were all the expenses for the three months?

2. The mason work of a new school-house cost \$12,200, the carpenter work \$10,180, the painting and glazing \$1,430.75, and the furniture \$2,137.69. How much did the school-house cost?

3. Five men buy a ship. A pays $11,725, B pays $2,310 more than A, C pays $1,075 more than A, D pays $619 more than B, and E pays $381 more than C. How much does each man pay? How much does the ship cost?

4. For selling seven farms an agent received $136.50, $95.25, $67.90, $205.37, $93.75, $286.62, and $110.30. How much did he receive in all?

5. A man who owed $580, paid at one time $165.80, at another time $48.75, and at another $153.69. How much did he then owe?

6. Four men buy a ship for $50,215, the first man paying $10,348, the second $12,932, and the third $9,345. How much does the fourth man pay?

7. My income is $2,200 a year. If I pay $325 for rent, $986.25 for household expenses, and $231.19 for other purposes, how much do I save in a year?

8. A lady paid $795 for a town lot, and $5,672 for building a house on it, and then sold the property for $7,366. How much did she gain?

9. A man bought a store for $13,250; and after expending $317.42 for painting, and $263.85 for other repairs, he sold it for $481.25 less than it had cost him. For how much did he sell it?

10. One year the increase of a flock of 1,536 sheep was 857, and the owner sold 1,249. How many sheep were left?

11. A miller who had 7,450 bushels of wheat, ground 3,564 bushels, and sold 2,386 bushels. How many bushels had he then?

12. From a stock of 16,350 tons of coal, a dealer sold 572 tons, 659 tons, 3,028 tons, and 8,470 tons. How many tons had he then on hand?

13. A grocer bought a cargo of 609,275 pounds of sugar. *After selling* 81,000 pounds and 215,492 pounds, how *many pounds* had he?

14. One week a grocer bought 513 pounds, 781 pounds, 1,039 pounds, and 408 pounds of butter; from which he sold 632 pounds, 917 pounds, and 851 pounds. How many more pounds did he buy than he sold?

15. A dealer has 1,784 pairs of boots and 2,536 pairs of shoes. After selling 932 pairs of boots and 1,702 pairs of shoes, how many pairs of boots has he? How many pairs of shoes has he?

5. 1. $15 \times 64 - 13 \times 17$.
2. $8 \times 70 \times 15 - 195$.
3. $36 \times 68 - 537$.
4. 29 times \$33, less \$342.
5. $\$72.35 \times 12 - \$519.50$.
6. $15 \times \$8.17 - 28 \times \$1.56$.

7. From seventy-two times one hundred fifty-nine subtract ten thousand seven hundred forty-three.

8. Take 93 thousand 849 from 355 times 1 thousand 450.

9. Multiply two hundred seventy-seven thousand forty by six hundred three, and from the product subtract eight times five million ninety thousand four hundred.

6. 1. My grain farm of 102 acres is worth \$85 an acre, and my dairy farm of 125 acres is worth \$50.50 an acre. Which farm is the more valuable, and how much the more?

2. A lady bought a cloak for \$58, and 17 yards of silk, at \$1.75 a yard. She paid for the purchases from a \$100-bill. How much money had she left?

3. A grocer bought 25 barrels of flour for \$187, and sold it at \$8.75 a barrel. Did he gain or lose? How much?

4. In the winter a farmer was offered \$18 a ton for 48 tons of hay. He kept the hay till spring, and then sold it for \$14.75 a ton. How much did he lose by keeping the hay till spring?

5. A merchant sold 85 yards of carpeting for \$76.50, which he bought at \$.75 a yard. What were his profits on a yard? On the 85 yards?

Make change from

6. A 10-dollar bill, for 12 yards of ribbon, at 35¢.
7. A 50-dollar bill, for 36 chairs, at 69¢.
8. Three 10-dollar bills, for 5 weeks' board, at $5.25.
9. Seven 5-dollar bills, for 72 bushels of oats, at 44¢.

10. From a stock of 150 dozen pairs of gloves, a merchant has sold 592 pairs. How many pairs has he on hand?

11. If you sleep 8 hours daily, how many hours will you have for work and play in the months of October, November, and December?

7. 1. 2,979÷9,+731,÷10.
2. 1,344+486÷99.
3. 63,840÷798+999.
4. $3,627+$9,981÷27.
5. $591.75÷25,+$384.17.
6. $527,052+$20,008÷4.

7. Separate $1,623.60 into 6 equal parts, and to one of the parts add $951.04.

8. I paid $121.60 for two carpets, one of which contained 28 yards, and the other 36 yards. How much did I pay a yard for them?

9. One year the receipts of a railroad were, from passengers, $3,300,875.36; from freights, $2,650,125.84; and for mail service, $231,850. What were the total receipts for the year? How much for 1 month?

10. In two weeks a hotel keeper paid $10.50 and $13.20 for grapes, at 9¢ a pound. How many pounds did he buy?

11. At $1.50 a day, how many days' labor will pay for a wagon that costs $81.25, and a harness that costs $22.25?

8. 1. 82,800÷23,÷40.
2. 3,765÷33,×60.
3. 16,209×15,÷27.
4. $15.06×36,÷144.
5. $2,923.91÷11,×24.
6. $234,564.16÷16,÷18.

7. Divide one hundred ninety-nine times four hundred eight by six hundred fifty-four.

8. Multiply eighty-two thousand three hundred eighty-six by three thousand three hundred, and divide the product by one thousand six hundred three.

9. What is the remainder, after dividing six thousand six times nine hundred seventy by five hundred thirty-nine?

10. Divide 72 times $40 into 8 equal parts.

11. Divide 56 times $1.05 equally among 7 women.

12. Separate 27 times 180 sheep into 9 equal flocks.

13. Find 15 times the quotient of 723,568 divided by 8.

14. Divide 8,680 by 124, and multiply the quotient by 86,492.

15. The dividend is 382,775, and the divisor is 2,500. What is the quotient? What is the remainder?

16. Divide 6,300 × 144 by 625 ÷ 5.

9. 1. I pay $73.50 for 20 pieces of prints of 49 yards each. How much do I pay per yard?

2. If 56 tons of iron castings cost $3,872.40, how much does 1 ton cost? How much do 45 tons cost?

3. If 1 dozen hats cost $42.72, how much do 27 hats cost?

4. If a woman earns $42 in 24 days, how much does she earn in 248 days?

5. How many dozen eggs, at 18¢ a dozen, will pay for 8 pounds of raisins, at 27¢ a pound?

6. If 4 yards of lace cost $5.56, how much will 15 yards cost?

7. If 7 men earn $161 in 10 days, how much does each man earn in a day?

8. How many tons of coal, at $7.50 a ton, will pay for 15 barrels of flour, at $8.50 a barrel?

9. How many bushels of cranberries, at $3.25 a bushel, will pay for 2 barrels of sugar, at $22.75 a barrel?

10. I exchanged an improved farm of 360 acres, at $40 an acre, for 2,500 acres of unimproved Kansas land. How much did the Kansas land cost me per acre?

11. How many hours will it take you to count 9,952,000, if you count 64 in a minute?

12. How many days of 10 hours each?

13. How many weeks of 6 days each?

14. How many years of 52 weeks each?

15. If 3,120 rails are required for 240 rods of fence, how many rails are required for 170 rods?

10. How much is

1. 3,864,240—123,456÷8?
2. 772,144—15,001÷592?
3. 8,040,000—300,091,÷99?
4. $12,675—$1,675÷125?
5. $138,500—$21,250÷875?
6. $16,242.59—$7,951.64÷31?

7. Take 92 from 15 thousand 5 hundred, and divide the remainder by 856.

8. From four million six hundred two thousand one hundred subtract two million three hundred one thousand fifty, and divide the remainder by seventy-five.

9. I bought 54 pieces of ribbon for $110.64, and sold them for $118.30. How much did I gain on one piece?

10. An estate valued at $27,740 and indebted to the amount of $9,263, is to be divided equally among 6 heirs. How much is the share of each heir?

11. An importer bought 325 hogsheads of sugar for $30,875, and sold it for $35,750. How much did he gain on a hogshead?

12. A piano-forte maker sold 150 pianos for $63,750. The cost of making them was $56,250. How much were his profits on a piano?

13. A druggist retails 3 dozen tooth-brushes for $14.40, and gains $3.14. How much did the brushes cost him apiece?

ABBOTTS' ILLUSTRATED HISTORIES.

BIOGRAPHICAL HISTORIES. By Jacob Abbott and John S. C. Abbott. The Volumes of this Series are printed and bound uniformly, and are embellished with numerous Engravings. 16mo, Cloth, $1 00 each.

A series of volumes containing severally full accounts of the lives of the most distinguished sovereigns, in the various ages of the world, from the earliest periods to the present day.

Each volume contains the life of a single individual, and constitutes a distinct and independent work.

For the convenience of buyers these popular Histories have been divided into six series, as follows:

(Each series inclosed in a neat Box. Volumes may be had separately.)

1.

Founders of Empires.

Cyrus.
Darius.
Xerxes.
Alexander.
Genghis Khan.
Peter the Great.

2.

Heroes of Roman History.

Romulus.
Hannibal.
Pyrrhus.
Julius Cæsar.
Nero.

3.

Earlier British Kings and Queens.

Alfred.
William the Conqueror.
Richard I.
Richard II.
Margaret of Anjou.

4.

Later British Kings and Queens.

Richard III.
Mary Queen of Scots.
Elizabeth.
Charles I.
Charles II.

5.

Queens and Heroines.

Cleopatra.
Maria Antoinette.
Josephine.
Hortense.
Madame Roland.

6.

Rulers of Later Times.

King Philip.
Hernando Cortez.
Henry IV.
Louis XIV.
Joseph Bonaparte.
Louis Philippe.

Abraham Lincoln's Opinion of Abbotts' Histories.—In a conversation with the President just before his death, Mr. Lincoln said: "I want to thank you and your brother for Abbotts' series of Histories. I have not education enough to appreciate the profound works of voluminous historians; and if I had, I have no time to read them. But your series of Histories gives me, in brief compass, just that knowledge of past men and events which I need. I have read them with the greatest interest. To them I am indebted for about all the historical knowledge I have."

Published by HARPER & BROTHERS, New York.

☞ Harper & Brothers *will send any of the above works by mail, postage prepaid, to any part of the United States, on receipt of the price.*

HARPER'S YOUNG PEOPLE.

An Illustrated Weekly for Boys and Girls. 16 Pages.

PRICE FIVE CENTS A COPY, OR $2 00 PER YEAR.

Bound volumes (except Vol. I.) sent by mail, post paid, on receipt of $3 50 each.

IMPORTANT FEATURES.

Harper's Young People will continue to furnish its readers every week the usual variety of entertaining and instructive reading matter. The authors and artists who regularly contribute to its columns form a combination of talent which is without a parallel in the annals of juvenile literature. Wherever an intelligent interest is taken in the education of the young, it has won enthusiastic friends. Sprightly Stories, Stirring Poems, Amusing Rhymes, Diverting Anecdotes, Ingenious Puzzles, &c., will be found in every number. Both boys and girls will find in Harper's Young People valuable hints as to pleasant methods of spending their leisure time in the playground, in the family circle, or in the social gathering. Numerous Illustrations of the finest description will appear weekly in the paper, and carefully executed Copies of Noted Paintings will be given from time to time. The enlargement of the Post-office Box enables that favorite department to serve more efficiently than ever the p for which it was instituted; and letters from subscribers re- ing information, or soliciting exchanges of youthful lcome.